Volume 48, No. 7 September, 1959

THE SHOP TEACHERS' PROFESSIONAL MAGAZINE

INDUSTRIAL ARTS AND VOCATIONAL EDUCATION

SCHOOL OPENING NUMBER

A LIFETIME COMPANION

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SCHOOL YEARS are the formative period which lays the foundation for each student's career. This training must fulfill the future needs of *every* student. Those destined to fill management positions in industry especially require the advantages of practical shop courses. A thorough knowledge of basic processes and methods will help them keep pace with rapidly changing technological sciences and will play an important part in their advancement.

Highly essential in such training is the equipment used. It should be versatile, easy to operate, safe, ruggedly constructed, and accurate. All these features and more are available in South Bend Precision Lathes. That is why they have been selected for use in most of the better school shops in the United States and other countries.

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15A	8	4	9 (12)	28
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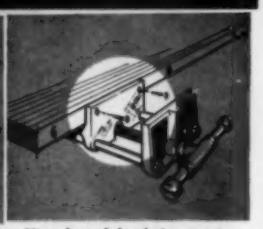

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SEPTEMBER
1959

VOL. 48 NO. 7

Industrial Arts and Vocational Education

The Shop Teachers' Professional Magazine

Published on the 15th of the month preceding the date of issue by THE BRUCE PUBLISHING CO., 400 North Broadway, Milwaukee 1, Wis. • CENTRAL OFFICE: 20 North Wacker Drive, Chicago 6, Ill. • EASTERN OFFICE: 233 Broadway, New York 7, N. Y.

★ ★ ★

This Month's Cover

The picture on this number of the magazine shows a student in the jewelry making section at Widener Memorial School for Orthopedically Handicapped at Philadelphia, Pa.

Mrs. Rheta Sidenback is the instructor.

Photograph sent to us by Benjamin J. Novak, Philadelphia, Pa.

Your Change of Address

If you have made a change of address since the close of the school year, please notify the circulation department of The Bruce Publishing Company, so that copies of the magazine will reach you promptly during the coming months.

★ ★ ★

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Discontinuance. — Notice of discontinuance of subscription must reach the Publication Office in Milwaukee, at least fifteen days before date of expiration. Notices of changes of address should invariably include the old as well as the new address. Complaints of non-receipt of subscribers' copies cannot be honored unless made within fifteen days after date of issue.

Editorial Contributions. — The Editor invites contributions bearing upon Industrial Arts, Vocational Education, and related subjects. Manuscripts, drawings, projects, news, etc., should be sent to the Publication Office in Milwaukee. Contributions are paid for upon publication. In all cases manuscripts should be accompanied by full return postage.

Articles Indexed. — The articles contained in the Magazine are regularly indexed in "The Readers' Guide to Periodical Literature," and "Education Index."

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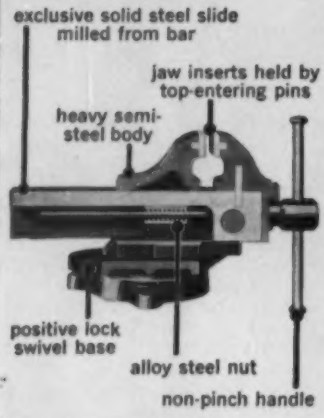
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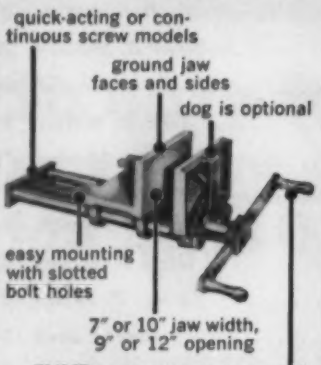
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Personal News

MR. ZIEGENHAGEN RETIRES

Frederick W. Ziegenhagen, principal, Boys' Trade and Technical High School, Milwaukee, Wis., retired in June, 1959, after 45 years at the school.

Frederick W. Ziegenhagen

He was born in Milwaukee on June 17, 1889, and entered grade school at the age of 7 at North Greenfield, now known as West Allis. At the age of 16, he started work at the Allis Chalmers Company as an apprentice patternmaker. At night he took advanced patternmaking courses at the University of Wisconsin Extension Division. After two years of working days and studying nights, he saw no future for advancement in the patternmaking trade and aspired to become an engineer.

After several years of preparatory engineering study, he was offered a teaching position in the Milwaukee School system. He accepted the position and on January 9, 1913, Mr. Ziegenhagen began his teaching career at the old Tenth Street School.

After one and a half years of teaching at the grammar-school level, he transferred to the Boys' Trade School. He was to work with Professor Emeritus Diamond as shop instructor in the pretrade department.

Mr. Ziegenhagen's ambition was to obtain a college education. He achieved this goal in 1929 when he graduated with a bachelor of arts degree, and in a few years, he received the masters of science degree from the University of Wisconsin.

Shortly after Mr. Ziegenhagen started at Tech, the newly appointed superintendent of schools, Milton C. Potter, thought it advisable to change the name of the school to the Boys' Trade and Technical High School. This meant that all the shops had to establish regular high school courses, which was adopted in 1919. This change created a great interest in the city of Milwaukee. The enrollment doubled every year until it reached the maximum of 2950 in 1924.

With this enormous load, every available nook and corner had to be used as class space. The shops were so spacious that there was little room for academic classes. The shop lecture rooms therefore were converted into extra academic classes.

In 1925 the annex building, which was the former Parks Street School, was added to Tech.

The depression years, from 1930 to 1940, saw a scarcity of jobs. Employers could afford to be "choosey." Industry began to demand that all apprentices possess high school diplomas. As a result, Tech had to reorganize its entire course of study so the student could qualify for a high school diploma.

(Continued on page 20A)

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Association News

COMING CONVENTIONS

Oct. 2–3. Ohio Vocational Association, at Southern Hotel, Columbus, Ohio. Secretary, Ralph J. Woodin, Room 203, 2120 Fyffe Rd., Columbus 10, Ohio.

Oct. 9–10. Four State Industrial Arts Conference, at Kansas State Teachers College, Pittsburg, Kans. Pirate, Forest L. Penny, Kansas State Teachers College, Pittsburg, Kans.

Nov. 6–7. Kentucky Industrial Education Association, at Kentucky Hotel, Louisville, Ky. Pirate, Paul E. Harris, 506 West Hill St., Louisville, Ky.

Nov. 6–7. New England Industrial Arts Teachers Association, at Hotel Taft, New Haven, Conn.

Dec. 7–11. American Vocational Association, at Conrad Hilton Hotel, Chicago, Ill. Pirate, Lowell A. Burkett, 1010 Vermont Ave., N.W., Washington, D. C.

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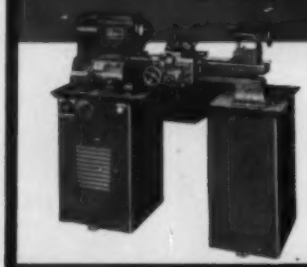

10" Lathe

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EPSILON PI TAU, NORTHERN STATE TEACHERS COLLEGE INITIATION

The initiation for Northern's BETA Epsilon Chapter of Epsilon Pi Tau was held on the campus at Douglas Lounge at Seymour Hall, Aberdeen, S. Dak., Saturday, May 2, 1959, with seven actives serving on the initiating team. A colorful and impressive ceremony was conducted.

Those initiated are: James E. Anderson, Webster; Edward D. Buchholz, Redfield; Charles A. Conger, Custer; Richard W. Crow, Lemmon; Leonard D. Edwards, Dupree; Dave N. Hazeltine, Custer; Jerome R. Heck, Firesteel; Harold B. Henley, Hayti; James R. Lewno, Waubay; Donald L. Poirier, Clark; Lloyd E. Rueb, Herried (graduate student, Stout State College, Menomonie, Wis.); Leroy J. Sanders, Sisseton (graduate student and graduate assistant NSTC); Kenneth L. Schmitt, Aberdeen; and Glen A. Strom, Groton.

Larry Wattier, the fraternity's president, presided at the initiation banquet held at 6:30 at the Ranch Cafe. Other current officers are: Arden Buchele, vice-president; Gordon Gavin, secretary-treasurer; and Robert Hempel, historian.

Dr. M. L. Meverden, NSTC's director of physical plant, was the featured speaker at the banquet, and his topic was "Concomitant Learnings."

Honor guests at the dinner were: Dr. and Mrs. Kramer, president; Dr. and Mrs. Jerde, dean; Dr. and Mrs. Lloyd F. Johnson, director of extension and field services; Dr. and Mrs. Meverden; and Mr. and Mrs. Kermit Wahl, assistant director of field services. — *Harry Gunderson, chairman.*

EASTERN CONNECTICUT IA ASSOCIATION

The schedule of meetings for the coming school year for industrial-arts teachers and supervisors east of the Connecticut River, is as follows:

October 8, 1959, at Rockville; December 3, at Coventry; March 3, 1960 (undecided); and May 17, 1960 (undecided).

This group is an affiliate of the Connecticut Industrial Arts Association.

Thomas Flanders of Moodus, Conn., is president. — *Normand Methot, secretary.*

IOWA I. E. ASSOCIATION CONVENTION

The Iowa Industrial Education Association will hold its annual convention at Des Moines, Iowa, on November 5 and 6, 1959.

Dewey Barich, president, Detroit Institute of Technology, will be the featured speaker, and he will address the group on "Space Age Demands on Industrial Education."

Wyatte De Loache, Public Relations Department of the E. I. du Pont de Nemours Company, will speak on "Research to Reality," at the Thursday evening fellowship banquet.

One of the current projects of the association is the promotion and sponsorship of Industrial Arts Clubs in Iowa high schools. Willis Wagner, Iowa State Teachers College, is president of the group, and Leonard Bengtson, Central Junior High School, Ames, is the secretary-treasurer.

Seth Boyden of Foxborough, Mass., developed a process for producing malleable iron castings in 1826. — *Steel Facts.*

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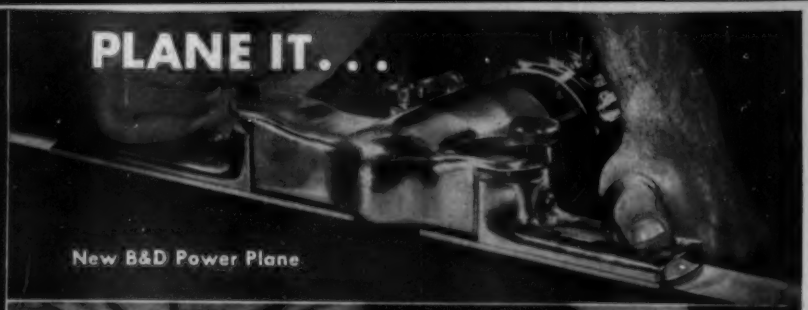

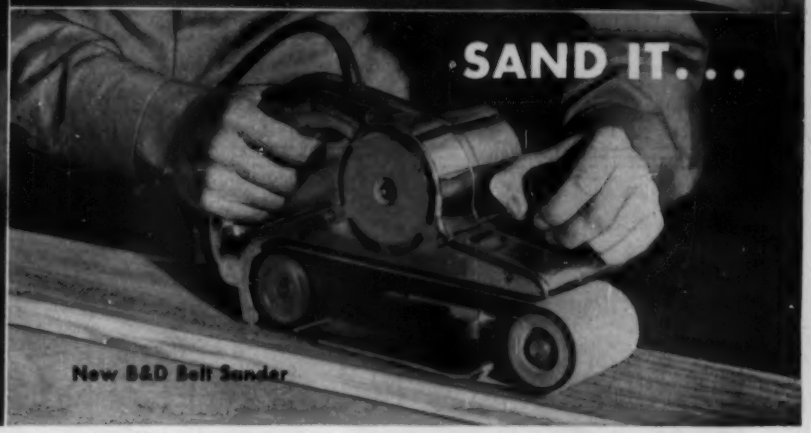

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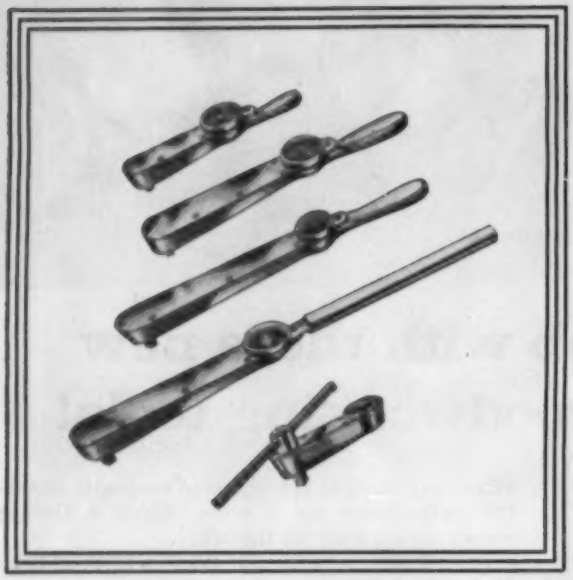

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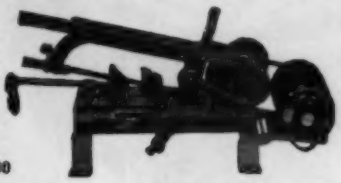

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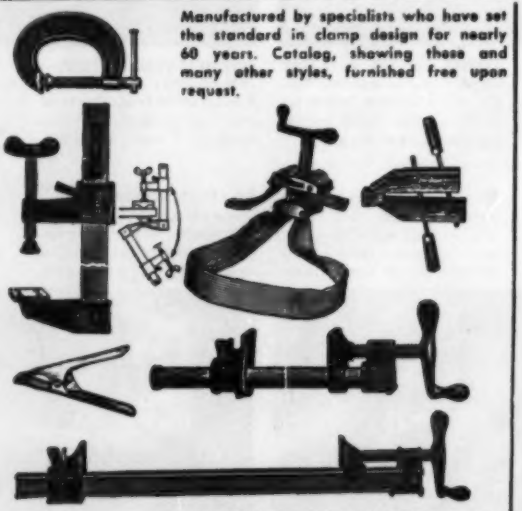

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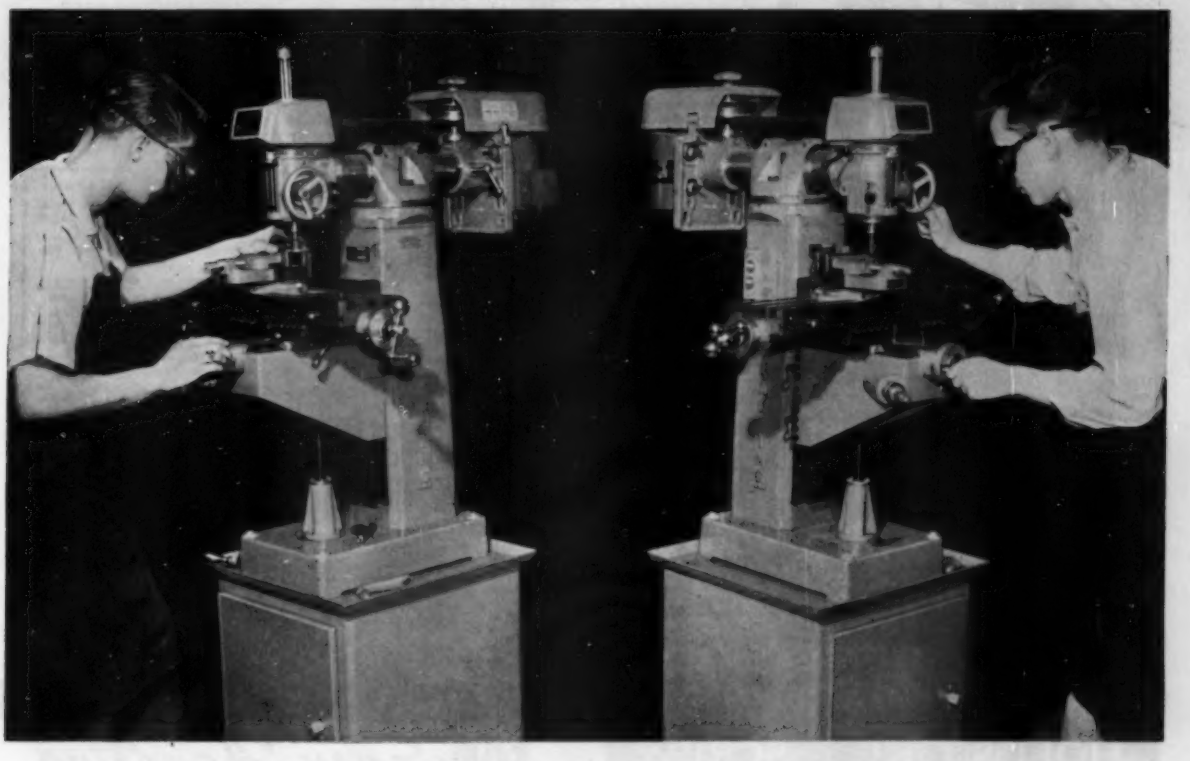

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With a Clausing Vertical Miller, your students can have their work set-up ready for operation almost as quickly as if the machine were a drill press.

And they can gain valuable experience on many different operations, including: Shaping; Surfacing; Drilling, Boring, Reaming; Dovetailing; Angular Milling; Slotting.

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The Clausing — a machine tool widely used throughout industry — is built to rigid standards for efficient operation, sustained accuracy and long service. For example, there are 7 ball bearings in the head and drive — feed screws have ground threads, turn on ball bearings — bearing surfaces of table, saddle and knee have gibs for lasting accuracy. It has the endurance you want and need.

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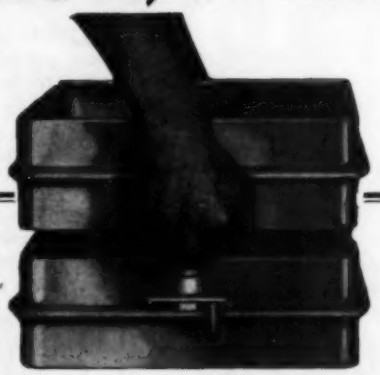

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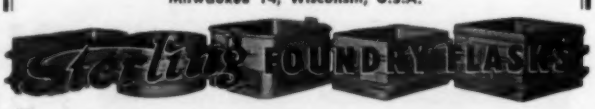

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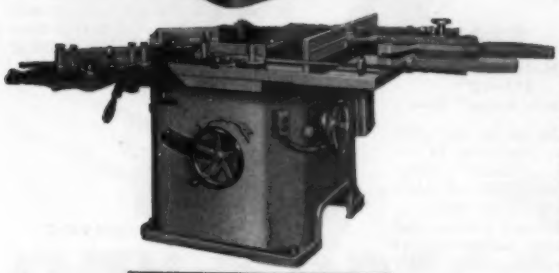

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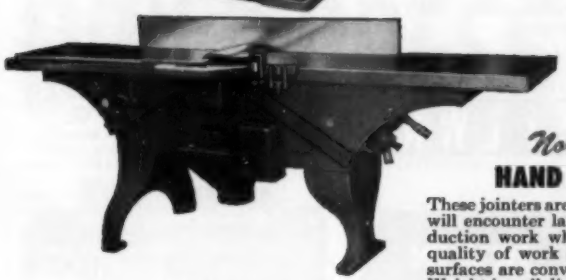

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These jointers are of the type the student will encounter later being used for production work where accuracy and fine quality of work are essential. Working surfaces are convenient to the operator. Weight is well distributed to make a well balanced smooth operating machine. The medium duty machine at right is available in eight and twelve inch widths. Tables are 6'2″ long; rabbet depth ⅛″. Heavy duty jointers are available in 12″ and 16″ sizes. Tables are 8′ long; rabbet depth ⅝″. They use a round three or four knife, safety type cylinder head, and a three horsepower, 3600 R.P.M. T.E.F.C. motor; five H.P. motors and belt drive machines also available.

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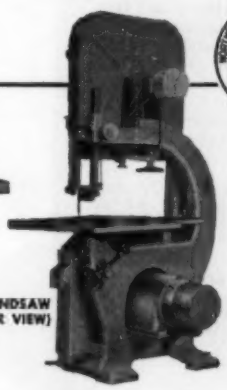

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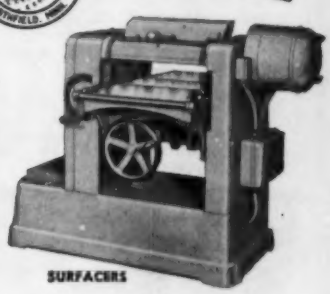

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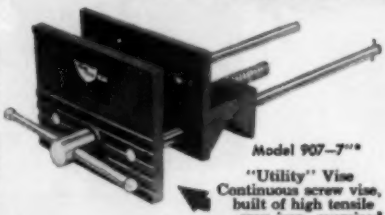

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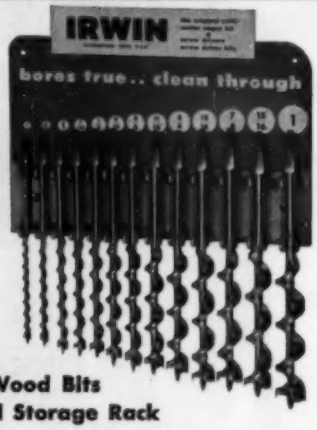

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SIZES ¼ to 1"

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every bit as good as the name

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17"
DRILL PRESS

In Floor and Bench Models

This new Walker-Turner "Light-Heavyweight" is a natural for school shop instruction—safe, dependable, accurate, and economical. It has the ruggedness to stand up under rough student handling and still last for years, with little or no servicing needed. And for added safety, the pulleys and V-belt in this unit are totally enclosed in an all-steel housing.

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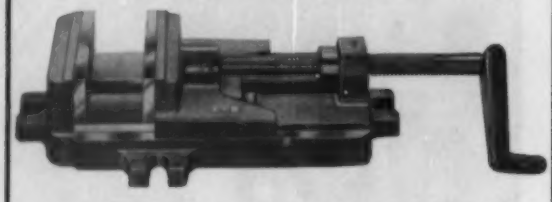

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1523½	3½	1⅜	3⅝	Steel	⅝	19
1515	5	2	6⅛	Plain	⅞	29½
1525	5	2	6	Steel	⅞	32

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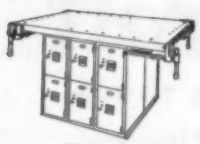

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lets students change bits safely, more easily with only one wrench. *Ask your SKIL Distributor for a router demonstration. Or mail coupon.*

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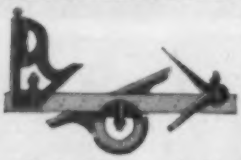
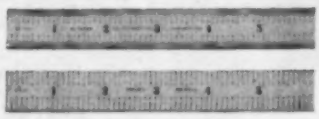


Furnished with square head, center head and 180 degree protractor head. Heads have wrinkled black enamel finish. Blade has quick-reading graduations. 12" size shown.



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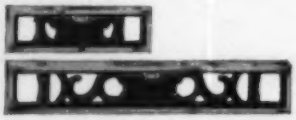

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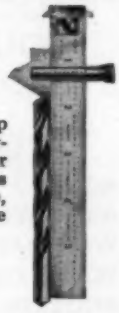

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John Metz Retires

guest editorial—

IT IS not just because he is a fine fellow and a pleasant person that we honor Mr. John J. Metz. There are many things that could be said about his pleasing personality, his keen interest in people, and his droll wit. These are the qualities that make him an interesting individual and a treasured friend. Of far greater importance to the readers of IAVE is the fact that for 32 years he has guided our professional magazine with a hand so skilled that IAVE has become the recognized voice of our profession.

The real measure of John Metz is his contribution to the fields of Industrial Arts and Vocational Education. This can best be seen by reviewing some of the issues of the magazine during the 32 years of his editorship.

At the time Mr. Metz took over the magazine it was known as the INDUSTRIAL ARTS MAGAZINE. As the name implies, the basic stress was toward the general education phases of our program. Thirty-two years ago, printed instructional material for shop teaching was relatively limited. Because of this lack, Mr. Metz promoted the idea of providing the shop teacher with much ready reference material in the form of tracing supplements. These supplements covered a wide range of subjects — from suggested projects to instructional methods. In those early years, a minimum of two pages was devoted to four or five editorials. Here was heard a strong voice expressing positive suggestions on major issues facing the profession. Mr. Metz wrote on such subjects as "English in the Shop," "Importance of Keeping Up-to-Date," "The Problems of Class Size and Organization," "The Depression and the Industrial Arts," "Having Definite Objectives," and hundreds of other timely topics. As one studies the issues of the early thirties, he soon recognizes Mr. Metz's firm grasp of the problems that faced our field and his ability to suggest good solutions clearly and forcefully.

During this early period, Mr. Metz also saw the lack of material in the area of tests and measurements, general shop, and curriculum. As a result, he devoted special issues to these areas. Many other ideas such as the publication of safety posters, posters on shop management, and other bulletin-board materials that teachers could use became regular features of the magazine. For a period, in addition to his own editorials, Mr. Metz persuaded some of the other leaders in our field to make contributions on important subjects. As an illustration of this, a monthly series entitled "Current Comments" by Dr. Homer J. Smith was featured in the magazine.

To reflect the true growth of our field and the importance of Vocational Education, the name of the magazine was changed with the June, 1930, issue to what it is today, IAVE, or INDUSTRIAL ARTS AND VOCATIONAL EDUCATION. With this change, more and more articles on trade and technical education began to appear. As the war years approached, much attention was devoted to the teaching of trades in the war-training program.

As the profession became stronger and more leaders came forward to express their ideas, Mr. Metz, the gentle and humble man that he is, began to limit the number and type of editorials that appeared. He had guided the profession to a place where he felt that it was no longer necessary to express such strong editorial opinions. Through his influence, many other men with writing ability made valuable contributions to the magazine.

A review of the more recent issues reveals that Mr. Metz has used facts rather than personal opinions in his editorials. In these more recent issues he has given more and more Industrial Education teachers the opportunity to see their own articles appear in print.

Mr. Metz always had a "feeling" for the needs of the profession. As the years went by he changed the nature and character of the magazine to meet those needs. While the early issues placed great emphasis on supplying teachers with specific content materials, the later issues have emphasized the broader professional problems.

The life span of Mr. Metz has been the life span of Industrial Education. He was born only three years after the Philadelphia Exhibition of 1876 where a display of technical work provided the spark for the beginning of "manual training." During his lifetime he has seen our profession grow from a few isolated woodshop programs to approximately 50,000 shops and as many teachers serving four million American students each year. As the old saying goes, "It's not what the magazine did for John Metz but what John Metz did for the profession" that really sums up a life of great service and significant worth.

— John L. Feirer, Western Michigan University

A Follow-up Study of Vocational School Students

CECIL O. SAMUELSON and DAVID T. PEARSON, SR.

The Salt Lake Area Vocational School is devoted exclusively to training in certain vocational pursuits on a post high school level. Because its training is so closely related to the job itself, it is believed that the ultimate success of this type of school depends upon the successful performance of its students on the job after they have left school. The State Legislature as well as other interested individuals and groups are concerned with the effectiveness of these students in the practical situation.

The general purpose of this study, therefore, was to look at a sample of students who had received training at the Salt Lake Area Vocational School to permit some estimate of the effectiveness of the training and the consequent adjustment of its students. Specifically, the aim was (a) to determine the status of those in the sample with reference to employment, salary, job satisfaction, and their feelings about the adequacy of their training; and (b) to note differences that may exist in the above categories between those who completed their training programs and those who withdrew before completion.

59 students completed their training course	In Trade 59%	Outside 12%	Unemployed 29%
41 students did not complete their training course	In Trade 20%	Outside Trade 58%	Unemployed 22%

Fig. 1. Present status of employment

The sample on whom this study was made consisted of 100 students who had left this particular institution during the period 1953–1955. Of this 100, 59 had completed their courses, while 41 had dropped out before completion but after they had been in school at least three months. The sample included all of those who had left all of the training departments of the school under these conditions during the first year covered by the study, but, due to circumstances beyond our control, only those who had been registered in Carpentry, Commercial Art, and Diesel Mechanics were followed up during the second year of the period. Actually, 70 per cent of those qualifying under the restrictions of this inquiry were located and are included herein.

Each of these 100 students was then interviewed personally and the answers to the information sought were recorded on an interview schedule prepared for this purpose. Standard arithmetical procedures were used to make the necessary computations.

As noted in the foregoing, the 100 former students considered here consisted of 59 who had completed their training and 41 who had been in

TABLE 1. Classification of Employed and Unemployed by Categories

	Employed		*Unemployed*	
	Completed	*Not Completed*	*Completed*	*Not Completed*
Veterans	9	15	3	2
Regular	15	6	3	1
Rehabilitation ...	6	0	6	2
High School	12	11	5	4
	42	32	17	9
Totals	74		26	

TABLE 2. Amount of Training and Feelings About Training

	Complete Training		*Not Complete Training*	
	No.	*Per Cent*	*No.*	*Per Cent*
All useful	39	66	25	61
Most useful	14	24	10	25
Adequate	5	8	1	2
Most not useful	1	2	1	2
None useful	0	0	0	0
No answer	0	0	4	10
	59	100	41	100

Drs. Samuelson and Pearson are associate clinical professors and coordinators of the vocational rehabilitation counselors training program at the University of Utah, Salt Lake City.

school at least three months but who had dropped out before completing the course in which they had been registered.

Figure 1 shows on a percentage basis the comparative employment status of the two groups: (1) those employed in the trade for which they had been trained, (2) those employed at jobs outside the trade for which they had been trained, and (3) those unemployed.

It is apparent that about three times as many students find employment within the occupations of their choice after having completed their course as do those who have had some training but who have not actually completed their courses.

However, it is interesting to note that the number[1] of unemployed in the completed group is almost twice as great as in the group that did not complete. Much of this may be explained in this particular instance by the fact that a large percentage of the unemployed in the completed group were physically disabled in some respect and would find placement more difficult and requiring more time. Some of these people no doubt have found suitable employment since. Also, many of those who dropped out of school before completing their courses entered employment as part of the circumstances associated with their dropping out of school, while those who stayed in school to complete courses had to seek employment at that time, rather than enter a job already waiting for them. Furthermore, those who did not complete courses were actually out of school a longer time and had more opportunity to get settled in a job.

Table 1 shows the numbers of the total sample distributed into the four categories: veterans, regular students, rehabilitation students, and high school students; regular students are those who do not fit into one of the other categories. The other parts of the table are self-explanatory. While the total number of the unemployed is much smaller than the total in the employed categories, the percentage of the unemployed who completed (17 of a total of 26 unemployed) is greater than the percentage of the employed who completed (42 out of a total of 74). The larger numbers of those in the unemployed category who have completed courses it should be noted are rehabilitation students and high school students. It has been our experience that it is typically more difficult to place the disabled and the very young students and accordingly takes more time. Incidentally, the three veterans in this sample were retired (although fairly young) and felt under no compulsion to seek employment.

[1]These numbers are the totals in Table 1.

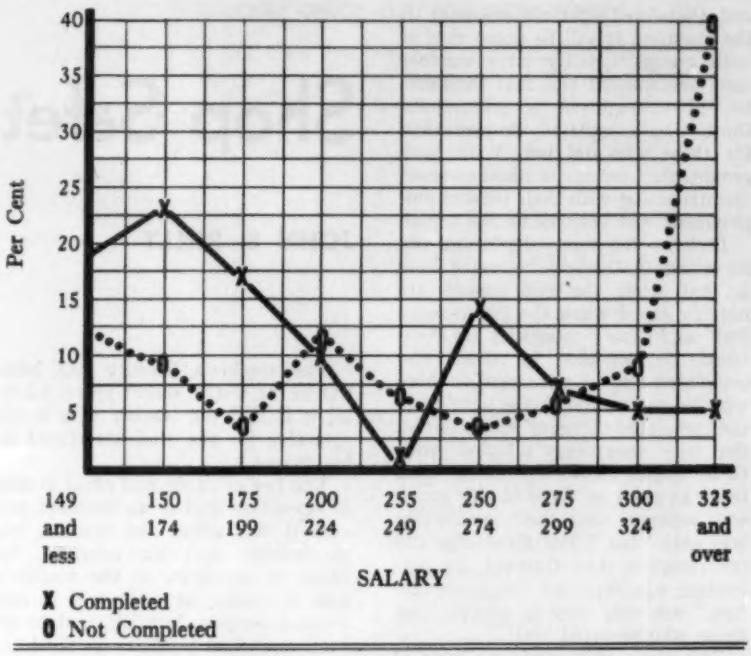


Fig. 2. Salary comparison between those who completed and those who did not complete courses

Figure 2 shows the relationships between these two groups with reference to salary. Two particular observations are pertinent here. First, the bulge in the salary intervals up to 199 for the completed group is caused by the relatively large percentage of graduates from practical nursing, cosmetology, and business. This represents a common beginning salary range in this locality for these three occupations.

The second point not revealed in this figure is that some of these graduates are now earning less money as beginners in their chosen fields than they were earning in the jobs they quit to take this training. In this locality there are any number of unskilled jobs that have a fairly high beginning wage scale, but with very limited opportunity for advancement. People leaving this type of job to go to school typically do so at a financial loss of at least a temporary nature.

Also, there are some of these students who have attempted to go to school full time while working full time with the result that longevity on the job tended to increase their salaries. This is particularly noticeable in the upper wage brackets. Those in this circumstance tended to drop out before completing their courses and to remain on the jobs in which they had their longevity. In making this comparison it must also be pointed out that the comparison is between graduates who are in beginning positions with those who dropped out and who consequently have been in employment longer.

Figure 3 shows, with reference to those who completed training and those who did not, the personal satisfaction with the employment in which they were engaged at the time of the survey. It should be pointed out that except for one person in each group all of those in the "didn't answer" category were unemployed

59 students completed their training course	Very Satisfied 46%	Fair 19%	Unsatisfied 5%	Didn't Answer 30%
41 students did not complete their training course	Very Satisfied 37%	Fair 34%	Unsatisfied 5%	Didn't Answer 24%

Fig. 3. Amount of training and job satisfaction

and therefore could not respond to the question. It will be noted that in both groups a fairly large number were unemployed and that the number of unemployed is greater for those who completed courses than for those who did not. With both groups, the percentage who expressed dissatisfaction with their present employment was very small and equal.

Perhaps the most significant observation that might be made here is that while the two groups are roughly equal when the "very satisfied" and "fair" categories are combined, 65 per cent for those who completed and 71 per cent for those who did not complete, the number in the completed category who reported that they were "very satisfied" with their employment was more than twice as great as those in this group who reported that their satisfaction was only "fair." For those who did not complete their training, the percentage who reported "very satisfactory" was only slightly greater than those who reported "fair."

The data presented in Table 2 represents an effort to tap the feelings of these two groups of former students concerning their estimate of the usefulness of the training they had received. While the percentages for some of the categories are about the same for both groups, the slightly higher percentage of the completions who felt that all of their training had been useful coupled with the fact that ten per cent of those who did not complete training declined to comment on the question suggests the expected that those who complete training courses would react more favorably to its value to them than would those who did not complete their courses. It further would be expected that negative feelings about the type and quality of training they were receiving would have some bearing upon the withdrawal itself. In each of the two groups there was one student who felt that most of the training received was not useful.

Conclusions

The data presented herein and within the limitations of this study would seem to support the general conclusion that in all the areas included in this study the evidence favors the completion of training courses. In certain instances a salary disadvantage may result from quitting a job to prepare for employment in another field. Also, the implications of this rather limited inquiry would seem to emphasize the need for a more thorough-going follow-up that might be geared to the regular operations of the school.

Shop Safety

JOHN E. REILLY

The teacher's liability has been put to the test in recent years. All in all it is still the teacher who is responsible for the students placed in his charge.

The law of cause and effect is still in operation and if an accident occurs it will affect the teacher, his psychology, and his program. In cases of negligence in the teacher's role in industrial education it can mean a lawsuit, lost job, and in all such cases bad publicity in the local community.

The best protection a shop teacher has is the feeling that he has developed a good safety program that protects the student, the teacher, and the equipment they use.

Teacher protection is probably most evident if he can show evidence that safety instruction has been offered in the area where an accident has occurred. This evidence is concrete and factual if the student is required to sign his name on a form sheet. This sheet should be filed away for future reference.

It would be a good part of a safety program to develop safety record demonstration sheets that cover the more dangerous pieces of equipment and possibly curtail operations the student may be required to perform.

Student programs are often approved by their parents when they are signed and returned to the principal or home room teacher. However, in specific shop areas it is also desirable to have the parent give approval for his son to operate certain types of shop equipment. A review of past years shows that four parents refused to have their son operate a

Mr. Reilly is a member of the industrial arts department of the Shawano, Wis., Senior High School.

Safety Record Demonstration Sheet

Student .....
Instructor .....
Grade ..... Date .....
Subject: General Shop

Adequate instruction has been given in the operations of the machines I have checked.

A. *Machine Shop Area*
- .... 1. Engine lathe
- .... 2. Drill press
- .... 3. Shaper
- .... 4. Buffer
- .... 5. Grinder
- .... 6. Power hack saw
- .... 7. Surface grinder
- .... 8. Milling machine
- .... 9. Handling metals

B. *Sheet Metal Area*
- .... 1. Squaring shears
- .... 2. Box brake
- .... 3. Pan brake
- .... 4. Slip rolls
- .... 5. Rotary machine
- .... 6. Setting down machine
- .... 7. Hand nib
- .... 8. Handling sheet metal

C. *Forge and Welding Area*
- 1. Gas welding
  - .... *a*) shut off valves
  - .... *b*) regulator adjustments
  - .... *c*) lighting torch
  - .... *d*) clamping metals
  - .... *e*) shut off torch
  - .... *f*) eye safety
- 2. Gas furnace
  - .... *a*) light furnace
  - .... *b*) shut off furnace
  - .... *c*) heat treating
- 3. Coal forge
  - .... *a*) light forge
    - .... 1) shavings
    - .... 2) non-volatile fluids
- 4. Electric Arc Welder
  - .... *a*) control adjustment
  - .... *b*) eye safety
  - .... *c*) clamping work
  - .... *d*) handling hot metals
- 5. Spot Welders
  - .... *a*) operation

D. *Eye Safety Areas*
- .... 1. Safety glasses issued
  - .... *a*) 100 per cent entire shop

E. .... 1. Safety rules and regulations given to the student on above equipment.

circle saw and in one case denial was made for the use of the router. Instances of this type make for unhappy experiences if accidents occur to these students on equipment that the parent will not sanction as part of his son's educational program.

A suggested form sent home with the student at the beginning of the term is presented below.

To: Mr. and Mrs. .....
Your son is enrolled for the current term in general metals. The school would like to have your permission for your son to operate shop equipment, after proper safety instruction has been given in its use and care.

Yes	*No*	*Machine Shop*
....	....	1. Engine lathe
....	....	2. Drill press
....	....	3. Shaper
....	....	4. Buffer
....	....	5. Grinder
....	....	6. Power hack saw
....	....	7. Surface grinder
....	....	8. Milling machine

Yes	*No*	*Sheet Metal*
....	....	1. Squaring shears
....	....	2. Box brake
....	....	3. Pan brake
....	....	4. Slip rolls
....	....	5. Rotary machine
....	....	6. Setting down machine
....	....	7. Hand nib

Yes	*No*	*Forge & Welding*
....	....	1. Gas welder
....	....	2. Gas furnace
....	....	3. Electric arc welder
....	....	4. Coal forge
....	....	5. Spot welders

NOTE: All students are required to wear safety glasses. Come and visit our school the week of open house.
Date ..... Signature .....

Positive reports and approval of this type are factual information the instructor should file. In the event that it is necessary to make reference to this part of the safety program it is readily accessible.

Overemphasis is a part of the program to be avoided. Rather adopt a stand that safety is contained in each instruction unit where it applies. The only way to do any job, is the safe way, correctly and in the least amount of time. This a requisite in holding a job in our society today.

Demonstrations of instructional units provide the patterns for purposeful activity on the pupils' part, offering an excellent opportunity to introduce the safety instruction relating to the work.

In the event of an accident there are three physical characteristics of the shop to be investigated.

1. Lighting conditions
2. Floor condition
3. Equipment condition

Natural light is probably the most

TEACHER CHECK LIST FOR SHOP SAFETY

Used	Not Used	
		A. SAFETY REGULATIONS
.....	.....	a. Printed
.....	.....	b. Oral
.....	.....	c. Posted on machines
.....	.....	d. Bulletins — charts
.....	.....	e. State industrial regulations
.....	.....	f. Safety test
.....	.....	g. Signed by students after instructions
		B. PARENTAL APPROVAL
.....	.....	a. Signed by parents
		C. DEMONSTRATION
.....	.....	a. Machines
.....	.....	b. Hand tools
.....	.....	c. Procedures
.....	.....	d. Safety zones — aisles
		D. PROTECTIVE CLOTHING
.....	.....	a. Eye protection
.....	.....	b. Aprons
		E. FIRST AID CABINET
.....	.....	a. Tourniquet
.....	.....	b. Antiseptics
.....	.....	c. Burn ointments
.....	.....	d. Bandages
.....	.....	e. Tape
		F. FIRE REGULATIONS
.....	.....	a. Disposal plan
.....	.....	b. Fire extinguisher
.....	.....	c. Fireproof containers
.....	.....	d. Fire drills
		G. ACCIDENT REPORTS
.....	.....	a. Student
.....	.....	b. Teacher
.....	.....	c. Office
.....	.....	d. Nurse
.....	.....	e. Doctor

— J. F. Jeffery, Erie, Pa., Schools

Learning the correct operation of the planer contributes to the shop's safety program.

In the well-conceived safety program, frequent checks of equipment and machines are a part of the instructor's responsibility, reducing severely the number of accidents in the school shop.

— J. F. Jeffery, Erie, Pa., Schools

desirable, but many times must be supplemented with artificial lights. Factors affecting lighting conditions with accidents are eliminated or used to the fullest extent if lights are placed in proper positions in the shop to provide sufficient light for work conditions. These lights should be turned on when classes are in session.

Zoning lines around machines and indication lanes of travel should be painted on the floor. These zoning lines must be enforced or they become meaningless. Nonslip mats should be placed at the machines for operators.

Good housekeeping is part of the student's work; and floors must be reasonably clean at the end of the class session, through the use of a pupil personal plan.

Proper functioning of machines and other equipment is paramount in a well-operated safety program. It is with the machines, tools, and other equipment that the student performs the operations necessary to complete his work. It is with this same equipment that accidents can happen to the student in the course of doing his work.

Frequent checks of equipment are necessary to insure its operation at peak efficiency. Cutting tools, lubrication, and proper adjustments of parts are the instructor's responsibility. While much of this can be delegated through the shop superintendent and the personal plan — the responsibility rests with the instructor in charge of the group.

Printed safety regulations handed to the student are desirable, but only if sufficient time is given in class to carefully examine each item. It is well to have the same forms fastened to a convenient location on each machine, mounted neat and clean.

Working surfaces of machinery and movable parts, that are painted in restful colors are further aids to reduction of shop accidents.

Instructional aids such as cartoons and clippings used on bulletin boards, changed frequently are valuable aids in keeping students aware of the need of safe work habits. In some cases a good touch of humor is the only push a reluctant student needs to make him aware of what the teacher is attempting to accomplish in the shop.

In the event of an accident or injury all students should be aware of these responsibilities:

1. Receive first aid
2. Accident report
3. School nurse or doctor

Every injury no matter how slight should be reported to the instructor and first aid administered. Students should be told that they must then report the nature of the injury on an accident report. Student reports are handy if the report slips are placed in the first aid cabinet.

Student Accident Report

Name .....
Date ..... Period .....
What kind of accident? .....
How did it happen? .....
Was first aid given? .....

Acceptance of safety reports from the student point of view can easily be defeated if they are required to fill out lengthy reports. Keep student reports brief.

Most teachers will agree that shop accidents are kept to a minimum. However, when they happen, a report should be made to the principal's office.

If the administration requires a more detailed report, then the shop instructor should make the report — either his form or a form used throughout the school. No report to the office is an indication of neglect of duty.

Some students in a group will invariably have injuries even though the majority of the mishaps are of a minor nature. In the event of infection from cuts and scratches, there is little likelihood for the instructor to explain the course of his action relating to the student placed in his charge.

This is where the shop teacher's liability ends. Information has been presented to the students in the form of safe practices, through example, written information presented and collected with students' signatures, along with an adequate policy of reporting shop injuries to the administration.

Further treatment of the problem is the responsibility of the administration. The student may be dismissed or he may be requested to report to the school nurse or to the school doctor.

The Training of Vocational Teachers

W. W. LUDEMAN

Our college operates an extensive vocational-trade department with offerings in auto mechanics, body repair, carpentry and cabinetmaking, upholstery, drafting, and radio-TV (electronics). Several times the past few seasons we have searched for instructors for one or more of these divisions and I can report that there is a critical shortage of such teachers. There are many top technicians in the various fields but few trained teachers. True, there are instances when good technicians make good teachers but they are rare.

Increasing Trend Toward Vocational Education

There is an increasingly stronger trend toward vocational and trade education all over America. This is true for both secondary and higher education. It started in the industrial and more populated areas but has moved into states of a more agricultural economy and more sparsely settled. The growing use of machinery for farming operation has caused a greater need for vocational training available to young men who will run the farms. The end result has been and will continue to be establishment of more and more departments in high schools and colleges where this type of preparation can be had. This in turn will create a brisk demand for teachers who are trained to handle vocational departments.

Vocational vs. Trade Education

The words, vocational and trade, have been used interchangeably. In a sense they are somewhat the same. A man taking auto mechanics training is in a trade and also a vocation. Generally we talk technically of vocational education when the course involves a four-year program which leads to a degree in a certain field. Otherwise if it is a one or two-year course for purposes of craftsmanship it should be termed trade education.

Curriculum for Vocational Teacher Training

The instructor of vocational-trade education should be an expert craftsman. But he must be more than that. His training should include:

General Education

All teachers should have a broad background of preparation that includes English, social science, music, art, humanities, psychology. The

Dr. Ludeman is president of Southern State Teachers College at Springfield, S. Dak.

FOUR-YEAR COURSE FOR TEACHING IN VOCATIONS
Leading to Secondary Certificate With Vocational Education Major

General Education

COMMUNICATIONS	SOCIAL SCIENCE	
Fall *Qtr. Hrs.*	*Winter* *Qtr. Hrs.*	*Spring* *Qtr. Hrs.*
Eng. 11 Gram. & Comp. 3	Hist. 21C Am. Hist. .. 3	Math. 17 Bas. or Math. 27A Tech. 3
Eng. 12 Gram. & Comp. 3	Pol. Sci. 25A U. S. Gov. 3	Sci. 11 Phy. or V. E. 24A Appld. Physics. 3
Eng. 13 Oral Comp. .. 3	Elective 3	Sci. 18 Hygiene 2
Sp. 21A Beg. Sp. or Bus. & Prof. Sp. ... 3		Sci. 29A or B Biol. Sur. 3

Professional Education

Psy. 11 Gen Psy 3	Ed. 40 Prin. of Sec. Ed. or Voc. Ed. 41 3	Ed. 43 Directed St. Tchg. 4
Psy. 21 or 36 Child or Per. Adjt. 3	Ed. 41 H.S. Admin. ... 3	Voc. Ed. 33 Tr. Anal. . 3
Psy. 31 Educational Psy. 3	Ed. 42 Tchg. H.S. Sub. or Voc. Ed. 42 Tchg.	Voc. Ed. 35 Prep. of In. Matls. 3
Ed. 22 Audio Vis. Aids 2	Proc. in V. E. 3	Voc. Ed. 43 Dr. St. Tchg. 4
Ed. 31 Tests & Meas. . 3		Voc. Ed. 45 or I.A. 45 Shop Mgmt. & Cont. 3

Industrial Arts

Ind. Arts 11 El. Wood W. 2	Ind. Arts 40A, B or C Gen. Mt. 4	Ind. A. Elect.-Draft ... 4
Ind. Arts 12 Ad. Wood W. 2	Ind. Arts 44 Tech. Dr. for Teachers 2	Ind. A. Electives 6
Ind. Arts 21A Wood Turn. 2		(Art. 11, 14, 21 or 31 will be accepted as satisfying I.A. electives.)
Ind. Arts 33A Wood Fin. 2		

NOTE: Wood Trades and Drafting majors will not take I.A. 11, 12, or 13, but they will substitute other Ind.-Arts courses for these.

Physical Education

Phys. Ed. 11A, B, or C. First Year P.E.	2
Phys. Ed. 21A, B, or C. Second Year P. E.	2
General Education and Professional Education Courses	73 qtr. hrs.
One Composite Major Teaching Field	72 qtr. hrs.
(48 hrs. — vocational; 24 hrs. I.A.)	
One academic minor field	23 qtr. hrs.
Elective hours (at least 20 in Jr. Sr. Subjects)	40 qtr. hrs.
Elective hours (at least 20 in Jr. Sr. subjects)	40 qtr. hrs.
Total required hours for the degree	208 qtr. hrs.

social subjects should include history, economics, sociology, and government. This type of general education training prevents the vocational teacher from adopting a narrow viewpoint and furnishes a wide cultural foundation for effective all-round teaching.

His Specialized Vocation

The vocational teacher should have one or not more than two major fields. Auto mechanics ranks first in interest followed by electronics, carpentry and cabinetmaking, body repair, drafting, and upholstery. At our college we require the vocational education major to be accompanied by a wide array of industrial-arts subjects on the assumption that the vocational teacher is often asked to teach a limited load in the industrial-arts shops.

His Professional Subjects

Along with general and educational psychology the professional training of the vocational teacher should include, history of vocational education, philosophy and principles of vocational education, materials and procedures of teaching vocational education, tests and measurements in vocational education, practice teaching in vocational education. The teacher training institutions have difficulty in finding facilities for vocational practice teaching. There are relatively few of such departments in high schools especially in electronics and drafting. Because of this there is a tendency for some vocational practice teaching to be done in the shops of the teacher training institution.

Southern's Vocational Teacher Curriculum

Southern State Teachers College has been in the vocational-trade education field since 1948. The courses are given on a one and two year college credit basis to prepare for jobs in the trades but on a four-year basis to prepare for vocational teaching. An outline of the degree course for teaching is presented on page 201.

Conclusion

There is one hundred per cent placement for the degree graduates in vocational teacher training. They are in demand in all states but especially in areas where the high schools lean toward the industrial and vocational type of instruction. The major problem in all vocational colleges is that of an adequate supply of college shop teachers and that situation will no doubt get worse before it gets better.

Evaluating Supervisory Practices

a checklist of supervisory practices—

Philosophy

THE SUPERVISOR:	*Check One* *No*	*Little*	*Much*
Understands the trends and problems of vocational education.	....	....	....
Understands the basic considerations of vocational education.	....	....	....
Is acquainted with the guiding principles and objectives of secondary education.	....	....	....
Is concerned with the occupational aspects of curriculum development.	....	....	....
Understands the recommendations of the general advisory trade council.	....	....	....
Understands the recommendations of the specific trade advisory councils.	....	....	....
Has general understanding of each trade.	....	....	....
Understands the objectives of technological courses.	....	....	....
Is able to co-ordinate and correlate shop instruction and technological aspects of the school's program.	....	....	....
Understands and believes in the democratic and co-operative concept of supervision.	....	....	....
Knows the threefold aims of vocational schools — the three competencies.	....	....	....
Understands that basically supervision is to improve the teaching-learning situation.	....	....	....
Understands the aims and objectives of each of the general objectives.	....	....	....
Enjoys the respect, confidence, and faith of all personnel.	....	....	....
Is able to keep down bickering, personality conflicts, and factionalism.	....	....	....
Places professional responsibilities above personal elevation or upgrading.	....	....	....
Works for intrinsic values.	....	....	....
Has clearly defined and limited administrative duties.	....	....	....
The staff understands the role of the supervisor.	....	....	....
Is a leader in constant evaluation.	....	....	....
Has the proper relationship with all faculty personnel and students.	....	....	....
Is able to work with persons representing federal, state, and local levels of operation.	....	....	....

Preparation

THE SUPERVISOR:			
Was appointed because of genuine interest and advancement in vocational education.	....	....	....
Is properly certified for his duties by both state and			

in a Vocational High School

WILLIAM D. LONG

	Check One		
	No	*Little*	*Much*
local requirements.	....	....	....
Has attended vocational orientation courses.	....	....	....
Has taught classes in vocational high school.	....	....	....
Understands the four-step teaching procedure in vocational work.	....	....	....
Has had courses in educational psychology.	....	....	....
Has had courses in educational methods.	....	....	....
Has had courses in shop management and shop planning.	....	....	....
Knows how to develop an occupational curriculum.	....	....	....
Knows how to develop a curriculum bulletin.	....	....	....
Knows how to develop daily lesson plans, procedure sheets, and instruction sheets.	....	....	....
Understands the place of training and visual aids in the vocational program.	....	....	....
Understands all public relations media and uses them.	....	....	....
Evaluation			
The supervisor is able to assist with the evaluation of the total program.	....	....	....
The supervisor engages in constant shop and classroom evaluation.	....	....	....
The supervisor uses evaluation procedures to improve the teaching-learning situation and not for inspectional, tenure, rating, and firing purposes.	....	....	....
The supervisor has planned with teachers methods to be used in evaluating the individual teacher.	....	....	....
The teacher understands the objectives and procedures of the supervisor.	....	....	....
No evaluation is made unless the teacher is informed of the supervisor's findings.	....	....	....
Follow-up conferences are a part of the evaluation program.	....	....	....
Teachers have faith in the supervisory program and the supervisor.	....	....	....
Re-evaluation is a definite and regular part of the evaluating program.	....	....	....
Teachers are informed of the supervisor's intention to visit.	....	....	....
The teacher's viewpoints are respected and accepted.	....	....	....
The supervisor creates and gives an atmosphere of comfort, ease, and confidence during the conference.	....	....	....
The supervisor acts as a leader and resource person.	....	....	....
The supervisor understands the techniques of professional counseling.	....	....	....

People in the vocational education field should be interested in the worthwhileness of their total programs. This calls for a continuous examination and re-examination of the total program in the light of established goals to see if these goals are being realized and to what extent the program is meeting the objectives.

Constantly we should ask ourselves, what are we trying to do as vocational people? How well are we doing? What are our procedures? How may we improve and what are the next steps? What has been the growth of the total program and the growth of each teacher and student?

Objection of Vocational Education

Are we, in real practice, approaching the real objectives of vocational education? What is our basic philosophy and what are our basic considerations?

The supervisory programs of all vocational high schools need to be constantly evaluated in the light of the changing concepts of education — both general and vocational, and also technological advancement, supervisory practices, and supervisory procedures. The old or traditional concept of supervision as the inspectional, fault-finding, fear-creating type of "snoopervision," where teachers looked on the autocratic despot with disaffection, is giving way to the newer concept of supervision.

Democratic Supervision

The newer concept of supervision is the democratic or co-operative type of supervision which is staff planned and created for self-evaluation, self-direction, and self-improvement with the aid of a person in the role of a leader and resource person. This person is able to create comfort, faith, confidence, co-operativeness, and a desire for improvement in the teacher. He understands, accepts, and counsels teachers who are looking for or need assistance.

The following points are items which are believed to be indicative of what advances the supervisory program according to the co-operative and democratic concept of supervision in a vocational high school.

Dr. Long is chairman of the trade and industry department of the Carver Vocational School in Atlanta, Georgia.

Problems and Projects

SANDALWOOD, THE PARASITE

ORVILLE A. OAKS
Wilmette, Ill.

Sandalwood, or Iliahi (Santalum sp.), as the Hawaiians call this sweet scented wood, is one member of the Sandalwood family. The family is noted for its parasites and half parasites, the Iliahi probably belonging to the half parasitic side of the family. But, the parasitic habit was not known when King Kamehameha the Great, of Hawaii, and his people carried on their lucrative trade in Iliahi with China. A trade so profitable that Kamehameha was able in one short generation to lead his nation from barbarism to civilization. Sandalwood came to the attention of the commercial world about 1778, and from 1810 to 1825 the trade was at its peak. The people were required to pay their taxes with Iliahi, and the old archives show that in one year nearly 400,000 dollars were realized for this fragrant wood. Soon, the ever widening search on all the islands for so valuable a wood exhausted the supply, and by 1840 all trade ceased. The Chinese called the Islands Tan-Shan or Sandalwood mountains.

Although it was generally believed all Sandalwood trees had been destroyed on the islands, such was not the case. About 15 years ago the Hawaiian Forestry Department began an experiment, planting seeds from trees found on the larger islands, but with no success as little was known of their parasitic habit. What was the answer? Studies made in India, the home of another Sandalwood (Stantalum album) revealed the fact that Sandalwoods were at least half parasites. A host tree must be provided so that the tiny hair roots or suck organs of the Sandalwood could fasten themselves to the hair roots of the host, and obtain the necessary food supply. Today, the Hawaiian Forestry Department has many thousands of Sandalwood trees grown from seeds obtained from Mysore, India. As the Sandalwood seeds are planted host tree seeds are also planted, usually Australian Pine (Casuarina sp.). When the Sandalwood seedling is ready for transplanting the host tree goes with it, as the tiny hair roots of the Sandalwood are firmly attached to the host, and disturbance or removal would kill the Sandalwood.

There are about ten species of Sandalwood, all closely related, occurring in India, the East Indies, the Malay Archipelago, Australia, Hawaii, and other islands of the Pacific. At the time of Robinson Crusoe's landing on Mas-a-Tierra, off the coast of Chile — known as Robinson Crusoe Isle — Sandalwood was the most famous tree there. But, as in Hawaii, ruthless cutting for the trade with China finally exhausted the supply, the last tree dying in 1916. Today India and Java are the main sources of supply, the Sandalwood of India probably being the most valuable wood in the world. While in Hawaii, during my Christmas vacation of 1939–40, I made a special trip to visit a big Sandalwood tree on Mt. Pele, island of Kauai, growing on the side of colorful Wiamea Canyon. This 20 miles of tortuous mountain road on the brink of the canyon wall, with a 2000 foot drop below me and the blue Pacific always in the background, will long remain a thrilling memory. The wood of all species is hard, close grained, easy to work, taking a lustrous finish. The color varies from a light lemon yellow to a suntan brown, depending on age and specie of tree as well as place of growth. Old Hawaiians told me the larger the tree the more valuable, as the fragrance increased with age and size. In young trees only the roots are scented; in old trees the oily heartwood is also scented.

Sandalwood in Hawaii is still much sought after by all lovers of precious wood, although the tree is now protected by law. Only dead trees can be cut. My good friend, the Acting Governor of the Islands in 1940, collected over a period of years enough Sandalwood to line a clothes closet in his new home, for his charming wife. In my own collection is one fragrant piece from a friend in Hilo, Hawaii, from a log surreptitiously carried on horseback from high up on the side of Mauna Kea, 13,825 foot mountain nearby. Besides other pieces from Hawaii, I have one small log from Java, worth a tidy sum today. Sandalwood is used by various oriental peoples for incense, perfume, and medicine, the Chinese being especially fond of it. In India it is used as a cosmetic due to its scent; and in ceremonies, as in the workshop of idols and the making of caste marks on the forehead. Even in modern India rich and poor alike add at least one piece of the wood to the funeral pyre. The wood is also used for carved fans, jewel and trinket boxes, and turning.

A CHILD'S CHAIR

LAWRENCE H. SELZ ORGANIZATION, INC.
Masonite Corporation
Chicago, Ill.

A child's chair, ingeniously designed for sturdiness and comfort, can be constructed in the shop at a cost of less than $5 for the hardwood framing and the Masonite 3/16 in. Tempered Duolux used for sides, seat, and back.

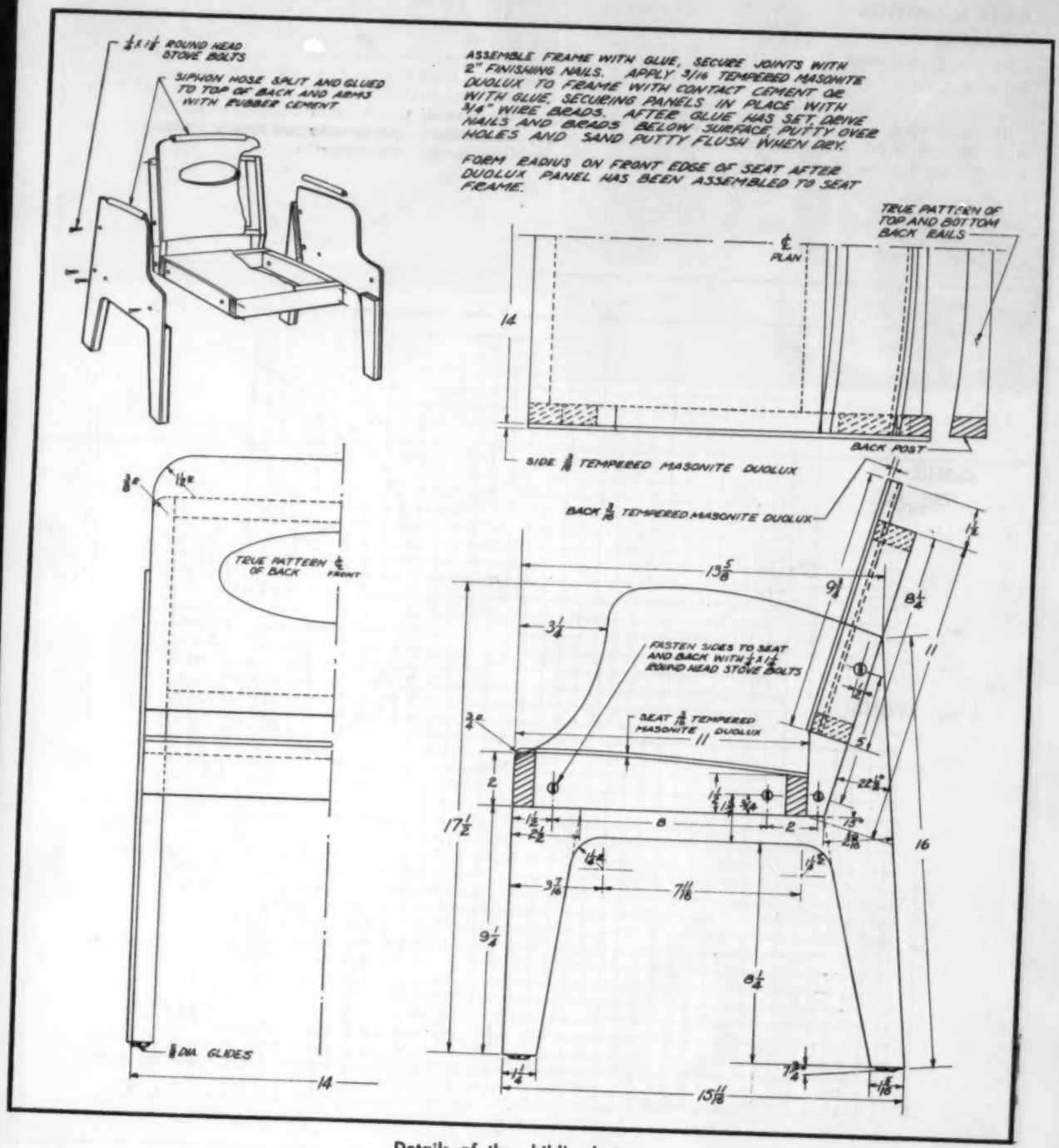
The seat, back, and sides with legs are constructed separately and then the components bolted together as shown in the accompanying drawing. Use glue and 1¾-in. finishing nails in assembling the frames and the hardboard, countersinking the nails and puttying the holes.

The back assembly is designed to be supported by the chair sides, it being held by the high leg extension as well as by the ¼-in. stove bolts.

Rubber siphon ¼-in. tubing, slit on one side, is attached with rubber cement to the top of the back rest and the arms. Chair glides go on the legs.

A two-tone finish, as shown in the half tone, gives the chair an attractive appearance. Priming and painting should be done before the units are assembled.

The completed chair


¼ x 1¼ ROUND HEAD STOVE BOLTS
SIPHON HOSE SPLIT AND GLUED TO TOP OF BACK AND ARMS WITH RUBBER CEMENT
ASSEMBLE FRAME WITH GLUE, SECURE JOINTS WITH 2" FINISHING NAILS. APPLY 3/16 TEMPERED MASONITE DUOLUX TO FRAME WITH CONTACT CEMENT OR WITH GLUE, SECURING PANELS IN PLACE WITH 3/4" WIRE BRADS. AFTER GLUE HAS SET, DRIVE NAILS AND BRADS BELOW SURFACE, PUTTY OVER HOLES AND SAND PUTTY FLUSH WHEN DRY.
FORM RADIUS ON FRONT EDGE OF SEAT AFTER DUOLUX PANEL HAS BEEN ASSEMBLED TO SEAT FRAME.
TRUE PATTERN OF TOP AND BOTTOM BACK RAILS
PLAN
14
BACK POST
SIDE ¼ TEMPERED MASONITE DUOLUX
BACK ¼ TEMPERED MASONITE DUOLUX
TRUE PATTERN OF BACK FRONT
FASTEN SIDES TO SEAT AND BACK WITH ¼ x 1¼ ROUND HEAD STOVE BOLTS
SEAT ¼ TEMPERED MASONITE DUOLUX
11
8
2
16
14
DIA. GLIDES

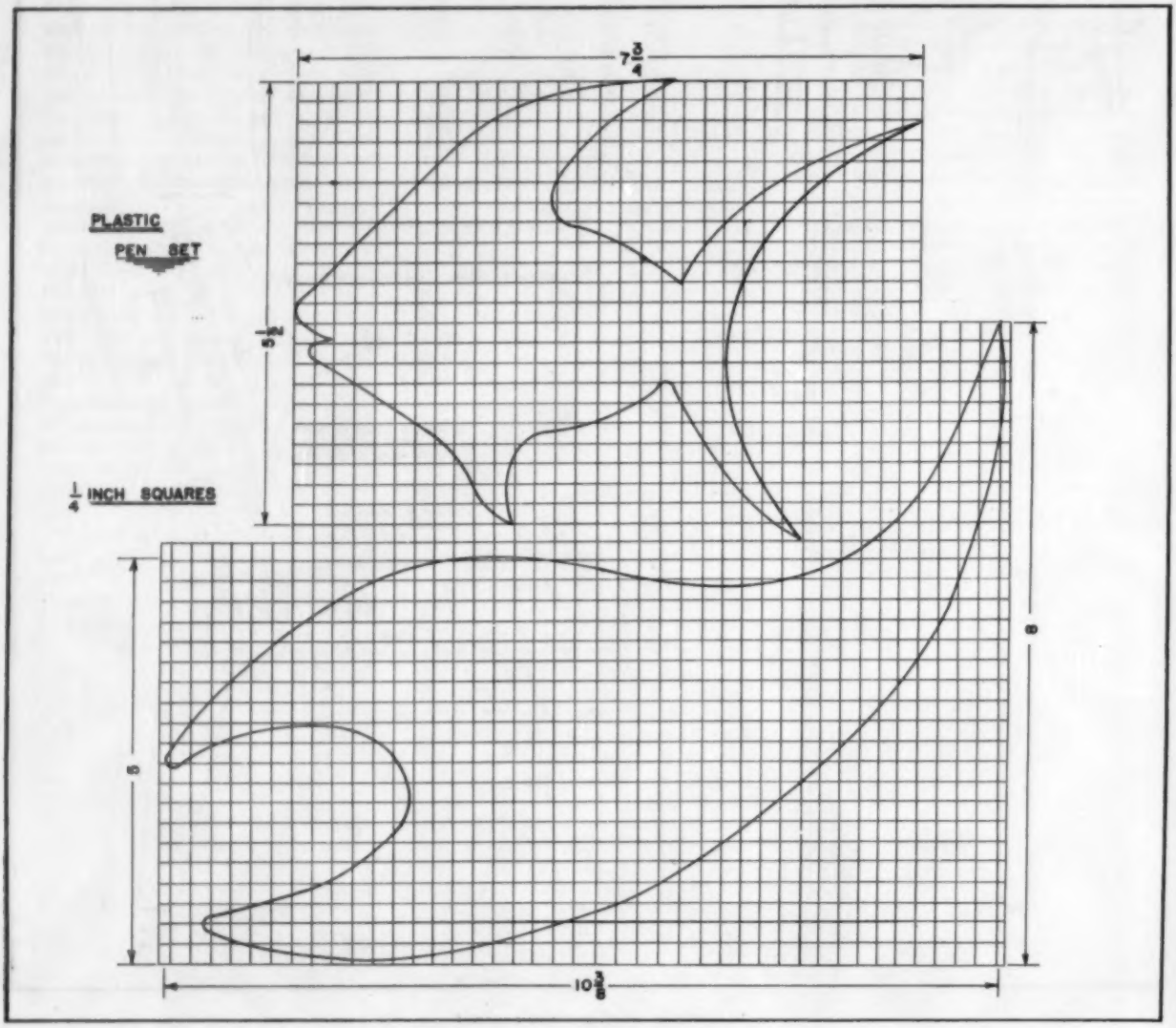
Details of the child's chair

PLASTIC PEN SET

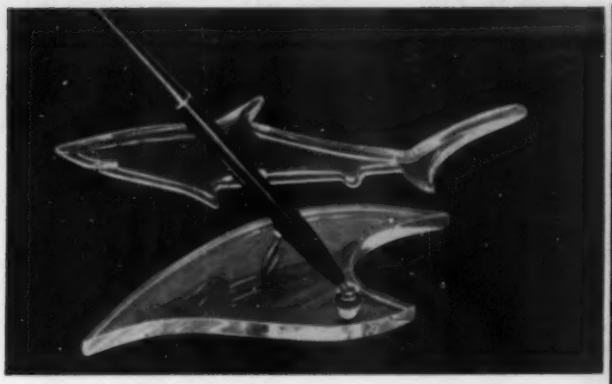
ELMER B. MATTSON
Metals Instructor
Carlmont High School
Belmont, Calif.

The ocean that dashes against our shores hides a wealth of new designs. A fishing trip has the potential of revealing them. The flowing and blending line of these aquatic animals provides many simple designs that can be transposed into attractive projects. The sea perch with its broad and thin design becomes an attractive pen set. When the South Pacific is mentioned one immediately thinks of sharks. This aquatic animal with its flowing tail and great size could easily become the basis of a simple design in plastic. Illustrated are two examples of potential pleasing projects using plastics as the medium.

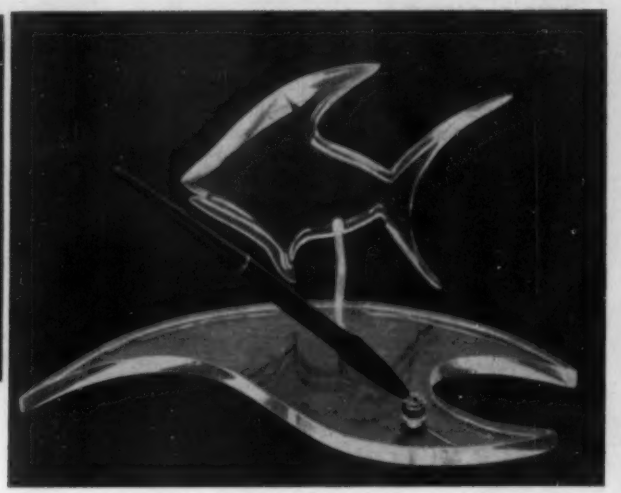
Develop the general shape of the fish and the bases by drawing squares on a large sheet of paper. The development completed is then transferred to ¼ or ½ in. plastic. Cut the project to shape by using the jig saw. File and blend the edges of the plastic into flowing lines. Buff the project with a soft buffing wheel. Assemble the project into final form by tapping and threading for final connection.

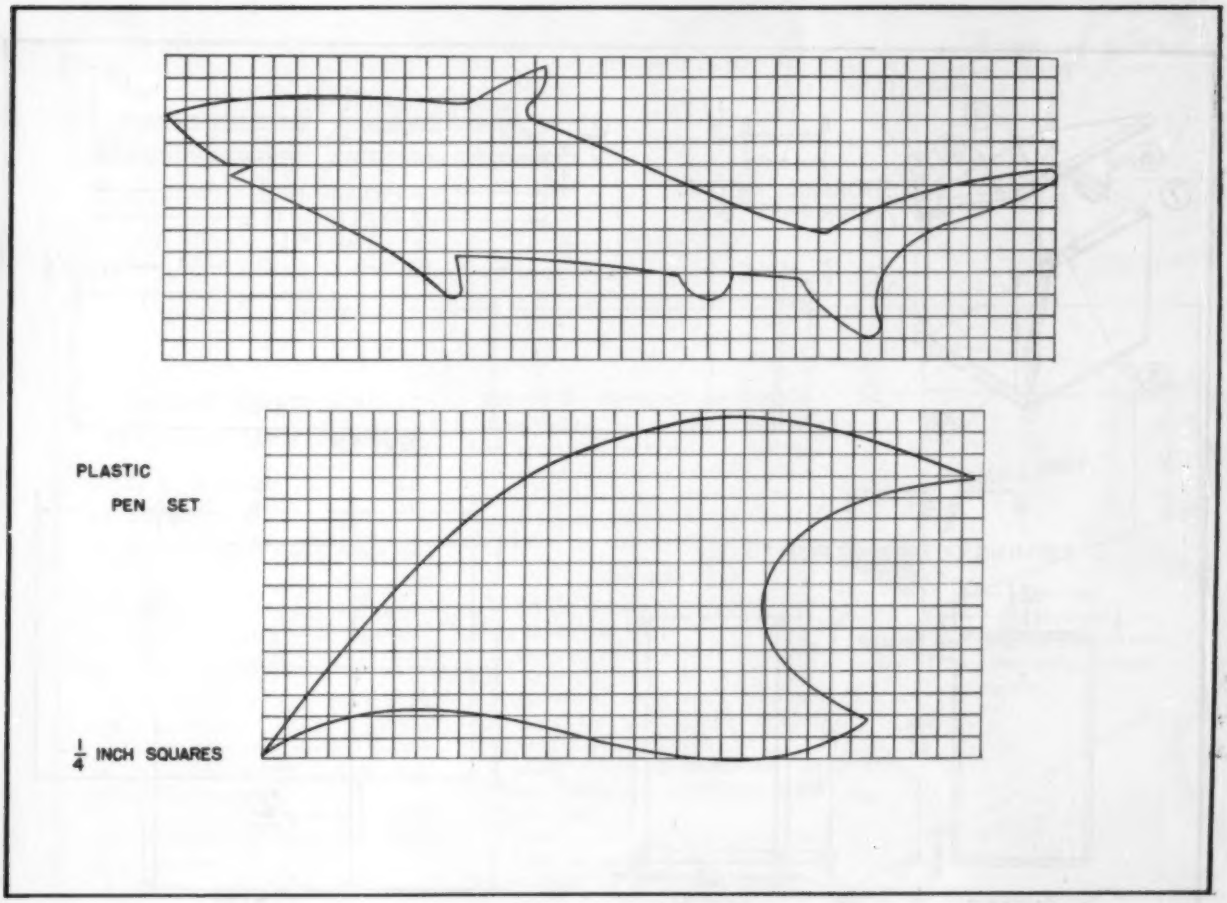


Silhouette and base for the sea perch



Shark and sea perch used as models





Silhouette and base for the shark

CAMPING ICEBOX

BERT F. GREENE

Union High School

Ceres, Calif.

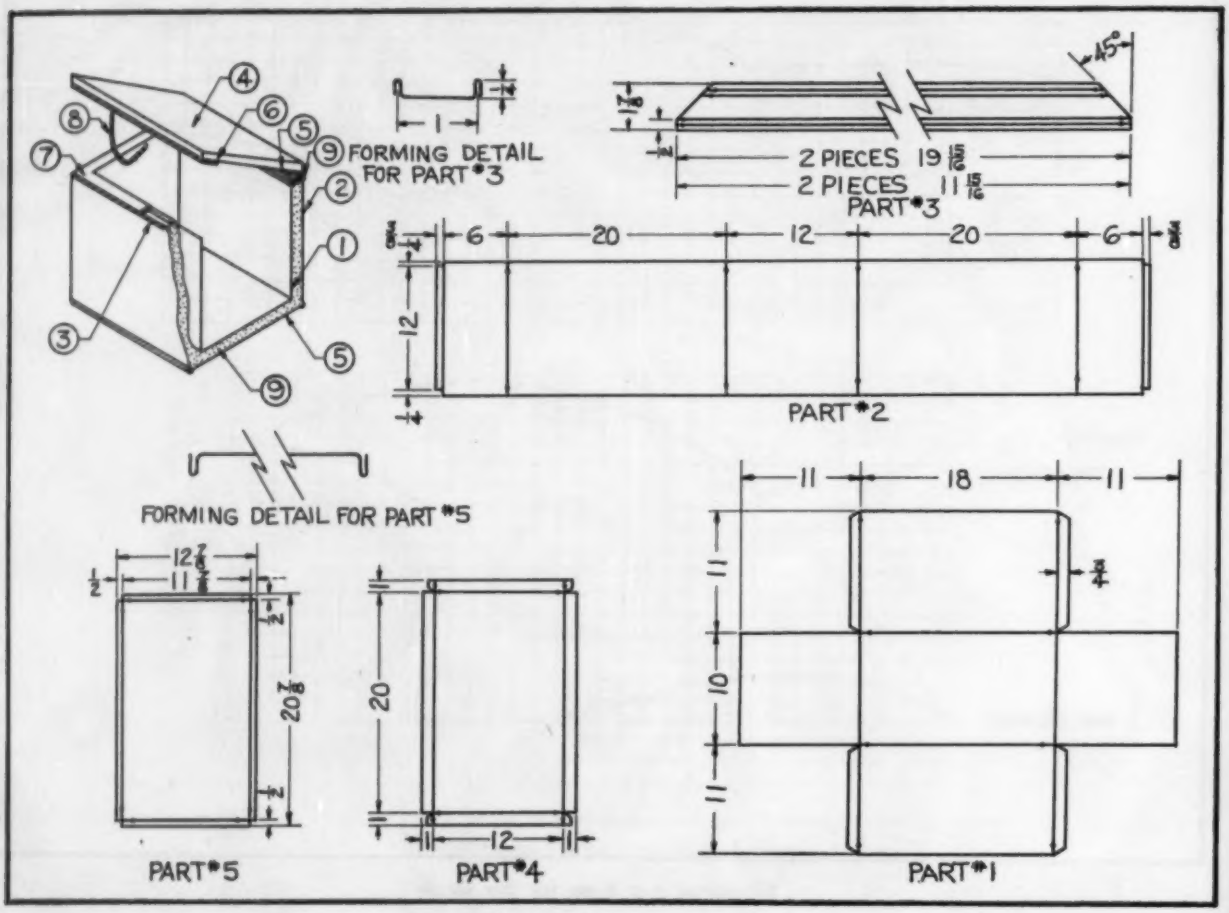
It is often difficult to find sheet metal projects that will interest the student. We believe we have a good one here in this camping icebox. When finished, the student has a box that will compare favorably with many of the commercially made boxes.

The first step in making the box is to cut a piece of 30-ga. galvanized sheet metal 32 by 40 in. The inside box is laid out as shown in the drawing, cut out, formed, spot welded, and soldered. The outside box is then laid out on a piece of 30-ga. galvanized steel 12 by 64¼ in. The ¼ by ⅜-in. rectangles are cut out on all four corners. Next fold the edges for the grooved seam. Put the metal in your brake and bend each line to 90 deg. Next the seam is grooved on the inside of the box. The student is now ready to start on part No. 3. He will need 30-ga. galvanized steel. After the layout and cutout is finished, the student folds Part No. 3 in the bar folder as shown on the drawing.

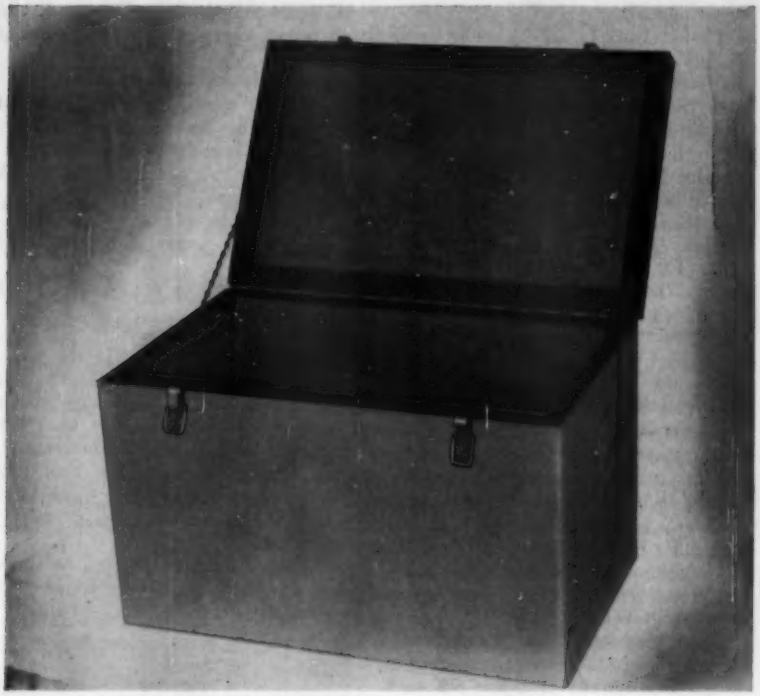
Part No. 3 is then placed upside down on a bench. The top edge of the inside box is placed in the groove. To make sure of proper fit, it is best to place the outside box in the second groove and check for fit. The outside box can then be taken off. Part No. 3 and the inside box can then be soldered. Care should be taken to make sure that the box is square at this point.

It makes the job easier if the handles are placed on the ends of the outside box at this time. We make our own handles by forming a piece of 5/16 round steel into the desired shape and fold a piece of sheet-metal over the rod. This turn is riveted to the outside box.

The outside box can then be put back in place and soldered. You are then ready to make Part No. 5. Since two of these are needed, one for the bottom and one for the bottom of the lid, it is best to make them at the same time. They are laid out on 30-ga. galvanized steel 12⅞ by 20⅞, cut out, and formed as shown on the detail. The top, Part No. 4, should also be laid out on 30-ga. galvanized steel 13 by 22, cut out, and formed as you would any box. Now that all the parts are made, you are ready to pack the box with insulation. We purchase fiber glass from our local lumber yard. The box is packed from the bottom and then one of the Parts of No. 5 is soldered in place. Next the top is filled with insulation and the second part of No. 5 is soldered in place. The wood strips are cut and placed along the inside edges of the lid. They are held in place by sheet-metal screws. The piano hinge and two suit case



Detail drawing of the camping icebox



Camping icebox

latches are put on the box with sheet-metal screws. Weather stripping purchased at an auto parts store is placed along the top of the box. The last step is to place a light chain on the lid and the other end on the side of the side of the inside box.

The icebox may be finished several ways. We have been painting most of ours.

BILL OF MATERIAL

Part No.	*No. Req.*	*Name*	*Material*	*Size*
1	1	Inside box	30-ga. gal.	32 x 40
2	1	Outside box	30-ga. gal.	12 x 64¾
3	2	Spacer	30-ga. gal.	19 15/16
	2		30-ga. gal.	11 15/16
4	1	Lid	30-ga. gal.	13 x 22
5	2	Bottom	30-ga. gal.	12⅞ x 20⅞
6	2	Wood trim	Wood	1 x ¼ x 19⅞
	2		Wood	1 x ¼ x 11⅞
7	5 Ft.	Weather strip		¾ x 7/16
8	1	Light chain		7 in. long
9	1	Piano hinge		19 in. long
10	2	Handle	Mild steel	5/16 rd. x 10
11	2	Handle	30-ga. gal.	3½ x 4
12	22	Sheet-metal screws		No. 7 x ½
13	8	Tinner rivets		1 pound

NAME CARD AND PERSONALIZED NAPKIN

JOHN R. WALKER

Bel Air, Md.

Project 1 — Name Card Procedure

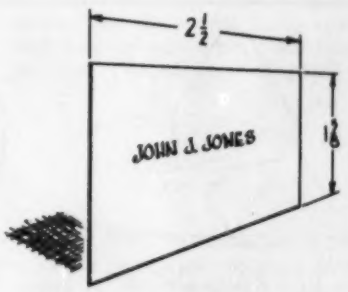
1. Cut the stock to the proper size. Use the method to obtain the greatest number of cards from a given sheet.
2. Set the composing stick to 20 picas and compose the job.
3. Remove the job from the stick and lock it in the chase.
4. Make the press ready. Oil and ink; place press board, Tympan sheet, and packing in place.
5. Make a trial impression on the Tympan; make the layout and insert the gauge pins.
6. Make a trial impression. Have it approved and then print. Wash down the press and distribute the type.

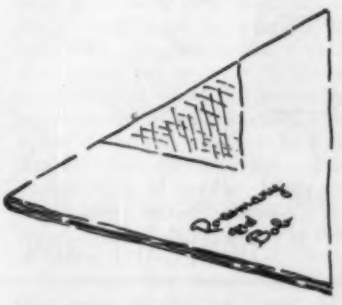
Project 2 — Personalized Napkin

This project also is very simple. The new operations involved are selecting and mixing of the proper shade of ink, working with textured paper, and working off square. The student is expected to furnish the table napkins.

Procedure

1. Set the composing stick to 20 picas and compose the job.
2. Remove the job from the stick and lock in the chase.
3. Make the press ready. Oil and ink; place the press board, Tympan sheet, and packing in place.
4. Make a trial impression on the Tympan. Make the layout and insert the gauge pins.
5. Make a trial impression on a napkin. Have it approved and then print. Wash down the press and distribute the type.
6. Safely dispose of the oily rags.





Above: drawing of the name card; below: the personalized napkin

MODELS OF THE FIVE REGULAR SOLIDS

PERCY MARTINS
Berkshire Industrial Farm
Canaan, N. Y.

The construction of various models of polyhedrons is an interesting project which can be carried on in the shop, drafting room, or academic classroom. Model making of this type requires the minimum in equipment and supplies, yet is of interest to students, and involves them in a worthwhile learning situation.

The five regular polyhedrons, commonly called the five regular solids, furnish a sufficient challenge to both the beginning and advanced students depending upon which of the models is constructed. More advanced students can do additional work of this type by constructing star polyhedrons, which are no more than variations and combinations of the five regular solids.

Some of the theory of sheet metal development can be explained through this type of model construction as the student can readily grasp the transition from laying out in one plane to the three-dimensional solid which is finally obtained.

The finished models may be used as decorative pieces, or combined to form interesting and distinctive mobiles. Although these models are easiest made from a heavy weight drawing paper, construction in sheet metal with soldered joints is also possible and useable.

We have successfully decorated paper models of this type with oil base paints, and tempera colors. The use of aluminum paint has also produced effective looking models.

No dimensions were given on the drawing because the size of the model should be determined by student choice and the availability of material. The majority of our models are laid out on a 12 by 18-in. sheet of drawing paper. The following dimensions have been found successful, both from the standpoint of fitting on this size of paper, and in giving a pleasant appearing model. The models shown in the photographs were all constructed from these dimensions.

Tetrahedron: Altitude of triangle 4½ in. The triangles are drawn at a sixty degree angle. All seams are 5/16 in.

Hexahedron: Squares are 3⅞ in. All seams are 5/16 in.

Octahedron: Altitude of triangle 3½ in. Triangles are drawn at a sixty degree angle. All seams are 5/16 in.

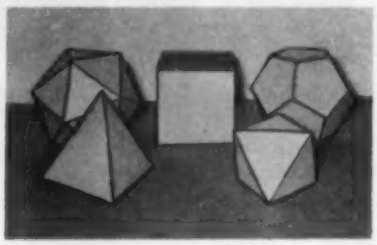
Dodecahedron: Since this figure is composed of 12 pentagons, we have found that instead of laying out each pentagon, it is easier to lay out one pentagon as accurately as possible on a scrap piece; cut this out, and use this as a template to draw the figure. Use a circle with a diameter of 3¼ in. for the layout of the pentagon.

Icosahedron: Altitude of triangle 2 9/16 in. Base of triangle 3 in.

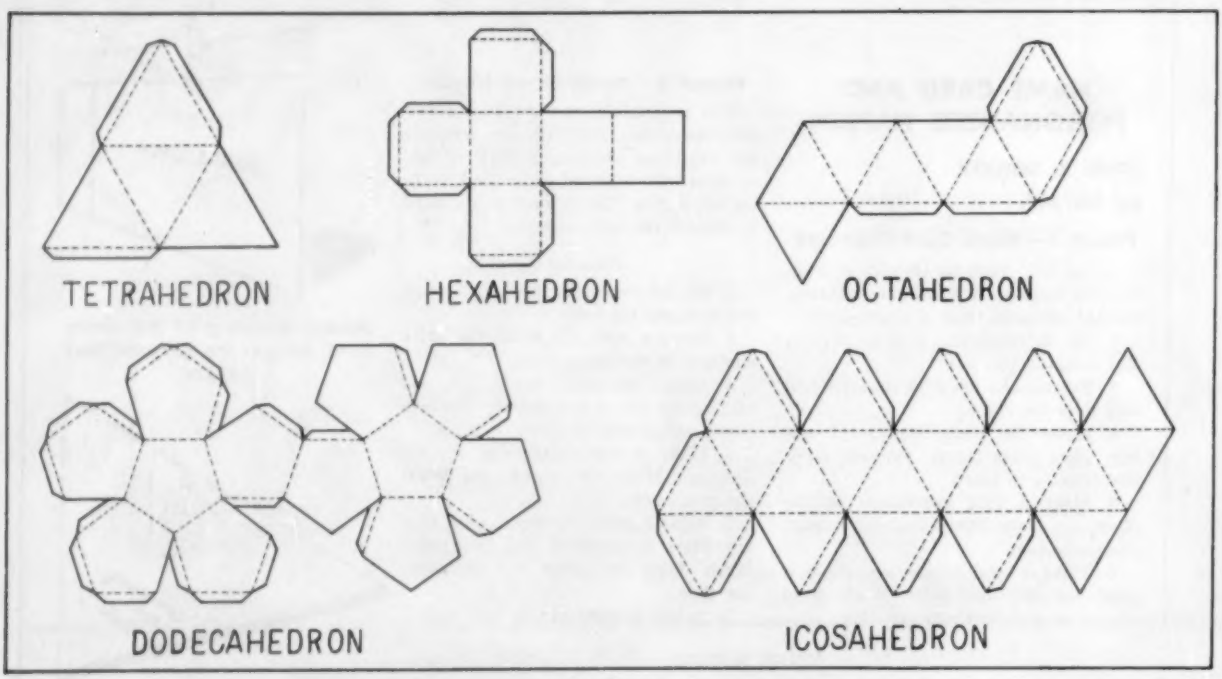
The dimensions given above for the various figures are given as a guide and are easily changed to meet individual needs.

Procedure for making models:

1. Select model, square a piece of paper on the drawing board, and lay out pattern as shown.
2. Be sure to make allowances for all necessary seams.
3. Cut out pattern on outside lines.
4. Fold all seams inward (toward you).
5. Fold model on dotted lines. Make all folds inward.
6. Fasten model together with fast drying glue or cement. On the larger figures such as the dodecahedron and icosahedron, folding and gluing should be done half from one side, then half from the other, to meet in the center.
7. After glued model has dried, trim with scissors, razor blade, and sandpaper to remove all sharp or uneven edges.
8. Apply finish with brush or spray. Use a straight pin in one corner joint to support the model while drying.



Five regular solids



Models of five regular solids by Percy Martins, Chatham, N. Y.

HOW TO CONSTRUCT A SUBMARINE AND CARTESIAN DIVER

EDWARD J. SKIBNESS

Minneapolis, Minn.

For those who are creative minded the submarine and the cartesian diver will be two very interesting and simple scientific projects to make. Both projects make use of two fundamental laws in physics, Pascal's law and Archimedes' principle. The projects further illustrate how the real submarine operates when descending and ascending.

The following directions make the construction of these projects very simple as no special tools or materials are involved. All that is required is an 8 by 12 in. sheet of unglazed paper such as typing or mimeograph paper or even newspaper will do. Also a piece of tin can metal and some paraffin wax. The tools needed are an 8d nail, a pair of pliers and a small low tin can (sardine or tuna can) in which to melt the paraffin. A candle two or three inches long or an alcohol lamp will provide the heat to melt the paraffin.

The submarine and cartesian diver are operated in a clear, quart size fruit jar or bottle completely filled with water. If the fruit jar is used it must have a Kerr type of cover, as this type is flexible enough to bend when pressure is applied to it and thus transmit the pressure to the water within. If the bottle is used a rubber stopper is preferred but an ordinary cork will be satisfactory.

If the inner part of the Kerr cover is replaced with a rubber diaphragm cut from a piece of old inner tube, the pressure on the water can be applied more easily and effectively.

To construct the submarine the first step is to fold the 8 by 12-in. sheet of paper twice. First at the middle the long way and then at the middle the short way as shown in Figure 1. This procedure simplifies cutting the strips. At the right end of the folded sheet rule off six lines ½ in. apart as shown in Figure 2. Next cut on these lines to form the six strips ½ in. wide and 12 in. long.

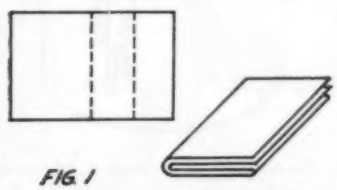


FIG. 1

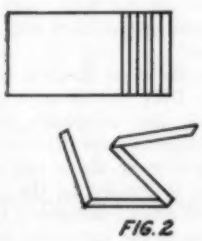


FIG. 2

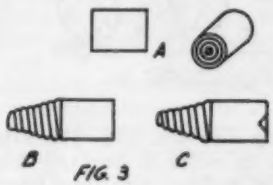


FIG. 3

The next step is to roll three of the strips onto an 8d nail to form a drum or cylinder ½ in. long as shown in Figure 3A. Two such drums are needed. In forming the drum it may be easier to start one strip at a time. When the first strip is one fourth on, start the second strip and when the second strip is one fourth on, start the third strip. At all times keep the sides of the strips as even as possible. After the strips are rolled up continue to roll the drum between the thumb and first finger until the drum becomes quite solid. Then carefully open the end of the last strip and apply paste or glue to it and again roll it down tightly against the drum.

Using the sharpened end of a pencil the next step is to push out the inner portion of the two drums to form two cones each 1 in. long as shown in Figure 3B. With the shears make a V cut ⅛ in. deep at the large end of the two cones as shown in Figure 3C.

The next step is to cook the cones in hot paraffin to make them waterproof. This is done by melting enough paraffin in the small, low tin can to cover the cones. Cook the cones 3 or 4 minutes or until there are no more bubbles. Be careful to not let the paraffin get too hot or it will smoke or even catch on fire. With a small piece

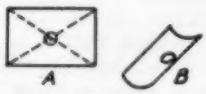


FIG. 4

of wire (hair pin) lift out the cones and let them cool.

Now cut from the piece of tin can metal a piece ½ by ¾ in., and locate on it the exact middle as shown in Figure 4A. At the exact middle punch a hole with the 8*d* nail. If the nail is cut off square and the metal laid on the end grain of a block of wood when punching, the hole will punch out clean. Otherwise the burr raised by the nail should be removed with a file. With a pair of pliers curve the metal the long way as shown in Figure 4B until it conforms to the large circumference of the cones.

After the cones have cooled and the metal made ready the small ends of the

FIG. 5

cones are filled with melted paraffin. This is done by holding the cone with the thumb and first finger and so that the small end is downward against the second finger. With a small wooden paddle drop melted paraffin into the larger end of the cone. Add enough paraffin to the

FIG. 6

inside to shape the cavity as shown in the enlarged view in Figure 5. It is important that the cavity slopes toward the opening to prevent water from being trapped at the ends and make the submarine operate out of balance.

The next step is to place the large ends of the cones end to end as shown in Figure 6. Be sure the V cuts are exactly opposite each other. Then dip the curved metal piece (½ by ¾ in.) in the reheated paraffin and place the metal over the cones so that its hole is directly over the opening in the cones. With a heated screwdriver blade stroke the metal. This will fasten the metal to

FIG. 7

the cones. With the wooden paddle pick up melted paraffin and plaster the entire outside of the submarine, but do not cover the opening. Any roughness or unevenness can be smoothed with a heated screwdriver blade. After a complete layer of paraffin coats the submarine it is tested for behavior. This is done by dropping it into a shallow dish or pan full of water. If the submarine sinks it shows that one or more layers of paraffin must be added to make it float. If one end appears to be heavier than the other, the heavy end will need another layer of paraffin. When properly balanced the submarine will float horizontally and should appear as shown in Figure 7.

To operate the submarine you first fill a quart size fruit jar almost full of

water. Then drop the submarine into the jar and fill the jar completely with water. Place the Kerr cover on the jar so there will be no air in the jar. When you press on the cover the pressure will be transmitted, by Pascal's law, to all parts and in all directions. This forces water to enter the opening in the submarine. Hence, by Archimedes' principle, the submarine will displace less

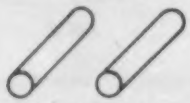


FIG. 8

water and will begin to descend. When the pressure is released the air within the submarine will expand and force the water out. Thereby the submarine will diplace more water and be made to ascend by the law of buoyance.

It is suggested that the jar be kept

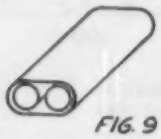


FIG. 9

in a shallow pan (cake pan) while being operated. This will avoid doing damage by any water that may leak out.

In place of the fruit jar any large size clear glass bottle can also be used. The procedure and operation are the same. A rubber stopper, being more flexible, will respond better to pressure and also have less leakage of water.

A Cartesian Diver

The cartesian diver seems a little easier to make than the submarine. To start you first cut four 1 by 6-in. strips from a piece of unglazed paper. On an

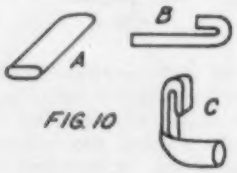


FIG. 10

8d nail roll two of these strips to form two tubes as shown in Figure 8. Roll the tube until it is solid and then apply paste or glue to the outer end of the strip and again roll it down tightly. These two tubes are to form the legs of the diver.

The next step is to wrap or roll a 1 by 6-in. strip around the two legs placed side by side as shown in Figure 9. This is to form the body of the diver. Roll the strip tightly and apply paste to the outer end. At the upper end of the body make cuts ⅛ in. deep at the four tangent points. Fold the four sections formed inward to close up that end. Paste over the end a piece of paper ⅜ by ¾ in. to hold the sections in place.

The arms are formed from the re-

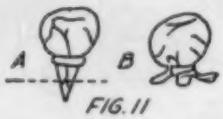


FIG. 11

maining 1 by 6-in. strip. This strip is cut in the middle to form two strips 1 by 3 in. Roll and paste these strips on the 8d nail as you did for the legs. Next flatten these tubes as shown in Figure 10A. Then fold each tube or arm ¼ in. in from one end as shown in Figure 10B. Pinch the fold with the pliers to close it tightly and completely. If one of the arms is given a right angle twist as shown in Figure 10C it will add life and interest to the diver.

The head of the diver is made by

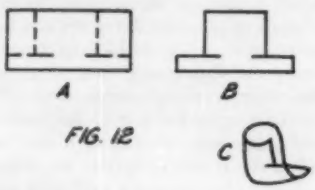


FIG. 12

first rolling a 2 by 2-in. piece of paper into a tight little ball. Place the ball at the center of another 2 by 2-in. piece of paper and join and twist together the corners of the second piece to form a covering with a tail for the ball as shown in Figure 11A. Wind several turns of thread tightly around the tail close to the ball (head). About ¼ in. from the thread, cut off the tail. Next spread out the folds of paper in the stub attached to the ball as shown in Figure 11B. This serves to attach the head to the shoulders.

The boots are made from two pieces of tin can metal ½ by 1 in. First draw a line ⅛ in. in from the edge the long way on each piece. Then ¼ in. in from each end of each draw lines to meet the ⅛-in. line as shown in Figure 12A. On the ⅛-in. line cut a distance of ⅜ in. in from each end. Then cut the two lines at the ends down to the ⅛-in. line to form a piece as shown in Figure 12B. With the pliers form 12B around one of the legs in which the 8d nail has been inserted. The finished boot is shown in Figure 12C.

The first step in the assembling of the parts is to place the two legs together and apply paste at one end. Insert the pasted ends of the legs into the open end of the body to a distance of ¼ in. Allow the paste a few minutes to dry before fastening on the arms.

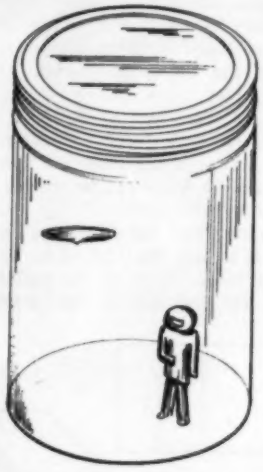
Apply paste to the ¼-in. folded por-

FIG. 13

tion of the arms which is the part attached to the body. The bent arm should also be pasted to the body. Wind a few turns of string or thread around the arms and body to hold the arms in place until the paste is dry.

Next apply paste to the upper end of the body (shoulders) and set on the head. Allow several minutes for the paste to get thoroughly dry. When the paste is dry the assembly is cooked in hot paraffin until there are no more bubbles. Remove the diver from the paraffin and let it cool while standing on its head. This will seal any openings at the upper end of the body. Next check to see that there are no openings at the lower end of the body. The bottom of the legs must be open.

Now slip on the boots and the diver is ready to test. The finished diver is shown in Figure 13.



To test the diver drop it into a cup or drinking glass of water. If the diver sinks one can cut small strips from the leg portion of the boots until the diver will float.

When the diver floats it is ready to operate. Drop the diver into a quart size fruit jar completely filled with water. Screw on the Kerr cover being sure there is no air in the jar. When pressure is applied to the cover, the diver will quickly descend to the bottom the same as the sumbarine does.

THREE DESIGNS FOR WALL SHELVES

GARTH E. WILCOX
Instructor
Tomahawk Vocational School
Tomahawk, Wis.

The three designs of wall shelves presented herewith have proved to be very popular with my students. They were designed with a radius of a circle on the end of the shelf. I designed them this way so that they could be readily built by beginning students. If a quarter ellipse is used in place of the radius, the project will look better and have a more unique appearance.

Plan I. This shelf is designed either as a single unit or it can be made in pairs. This shelf will look well and be very functional in any room in the house. Make the shelf from ½- or ⅝-in. lumber. Solid lumber or plywood also may be used.

Plan II. This plan was designed to be used in pairs, one right hand unit and one left hand unit. It looks very nice if it is used to accent a mirror, fireplace, large picture, or some other object.

The lumber can be either solid or plywood and should be about ½ to ⅝ in. in thickness.

Plan III. This plan is designed to fit in a corner. It can be made in either a right-hand or left-hand style by simply reversing the layout when laying out the stock.

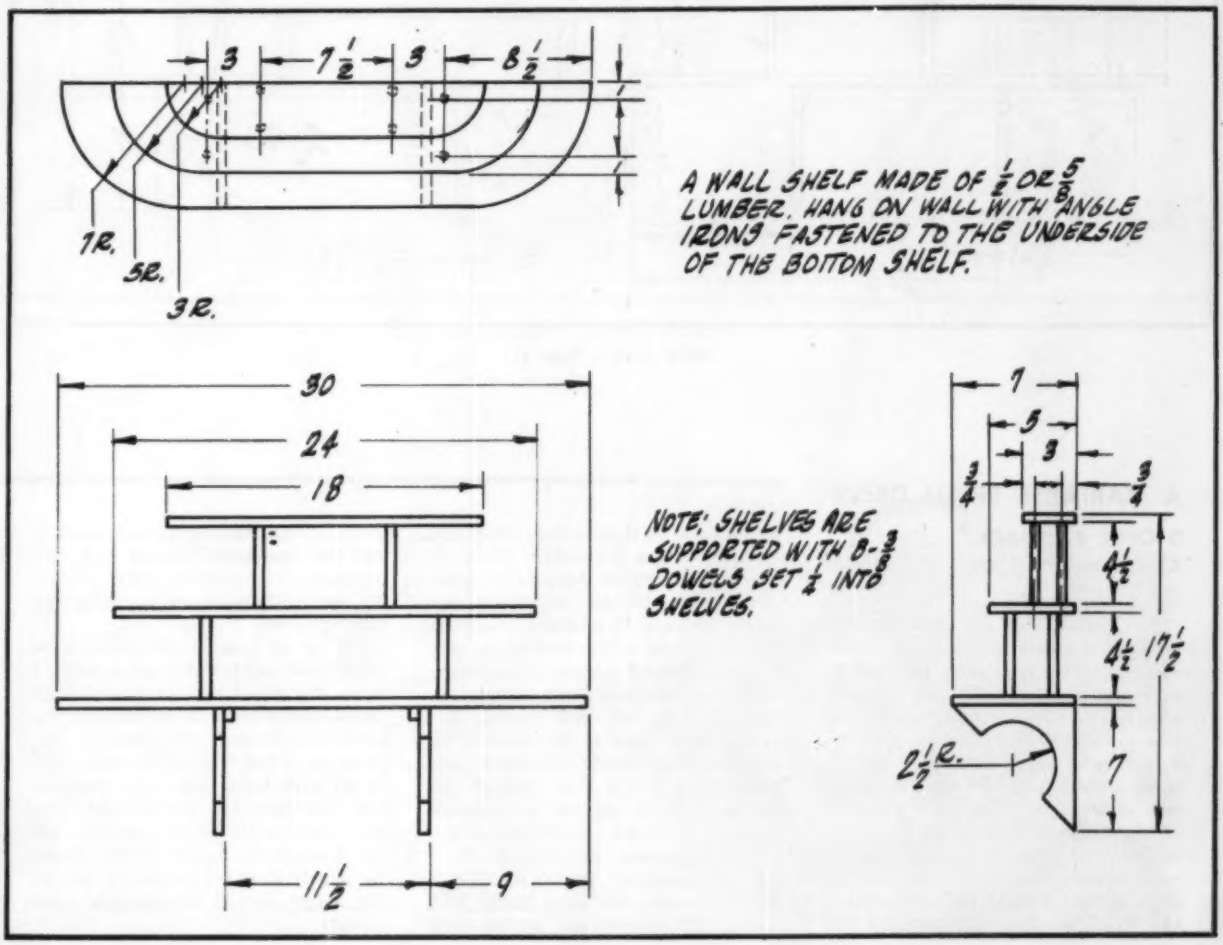
Lumber or plywood may be used; however, if solid lumber is to be used a dowel joint or some other suitable joint must be made where the small shelf joins the larger one. Again I would recommend ½ or ⅝-in. stock.

Procedure for Building Plans, I, II, III

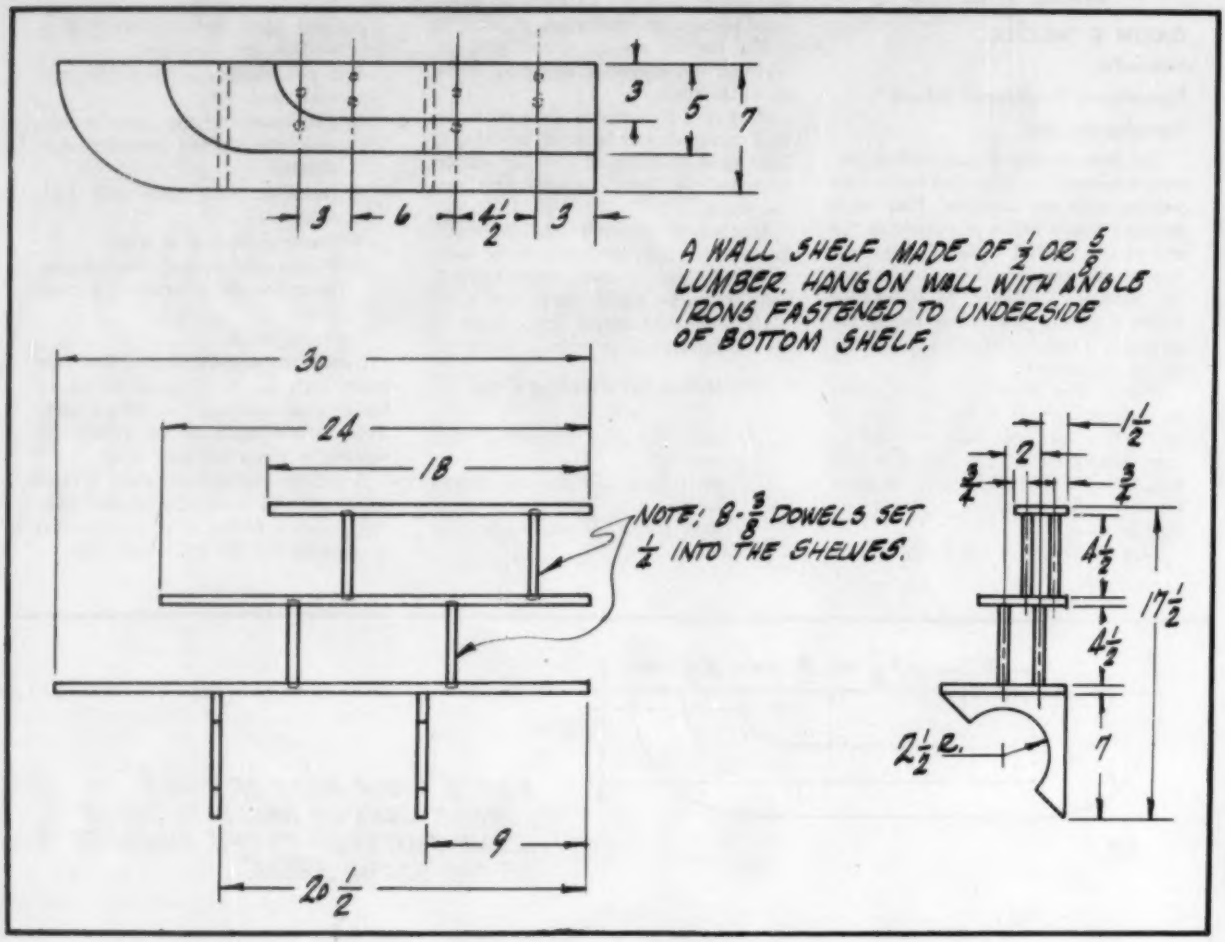
1. Study the plan you select very carefully.
2. Select stock and plane to desired thickness.
3. Make layout on stock very carefully.
4. Cut out each piece accurately with a band saw, jig saw, or a coping saw.
5. Sand edges and surfaces with a medium grit sandpaper.
6. Finish sanding with a fine grit sandpaper.
7. Cut dowels to the exact length, sand smooth and chamfer ends slightly.
8. Assemble with glue and wire brads.
9. Break arrises on all edges.
10. Fasten angle irons or a suitable hanger to the underside of bottom shelf.
11. Apply finish.

I would recommend that a dust free finish such as the General Finish or brushing or spraying lacquer be used. This will cut down on the amount of rubbing that you will have to do.

A well-designed project, which is carefully built and beautifully finished gives any person a feeling of self-satisfaction in knowing that the job is well done.



Wall shelf — Plan I



Wall shelf — Plan II

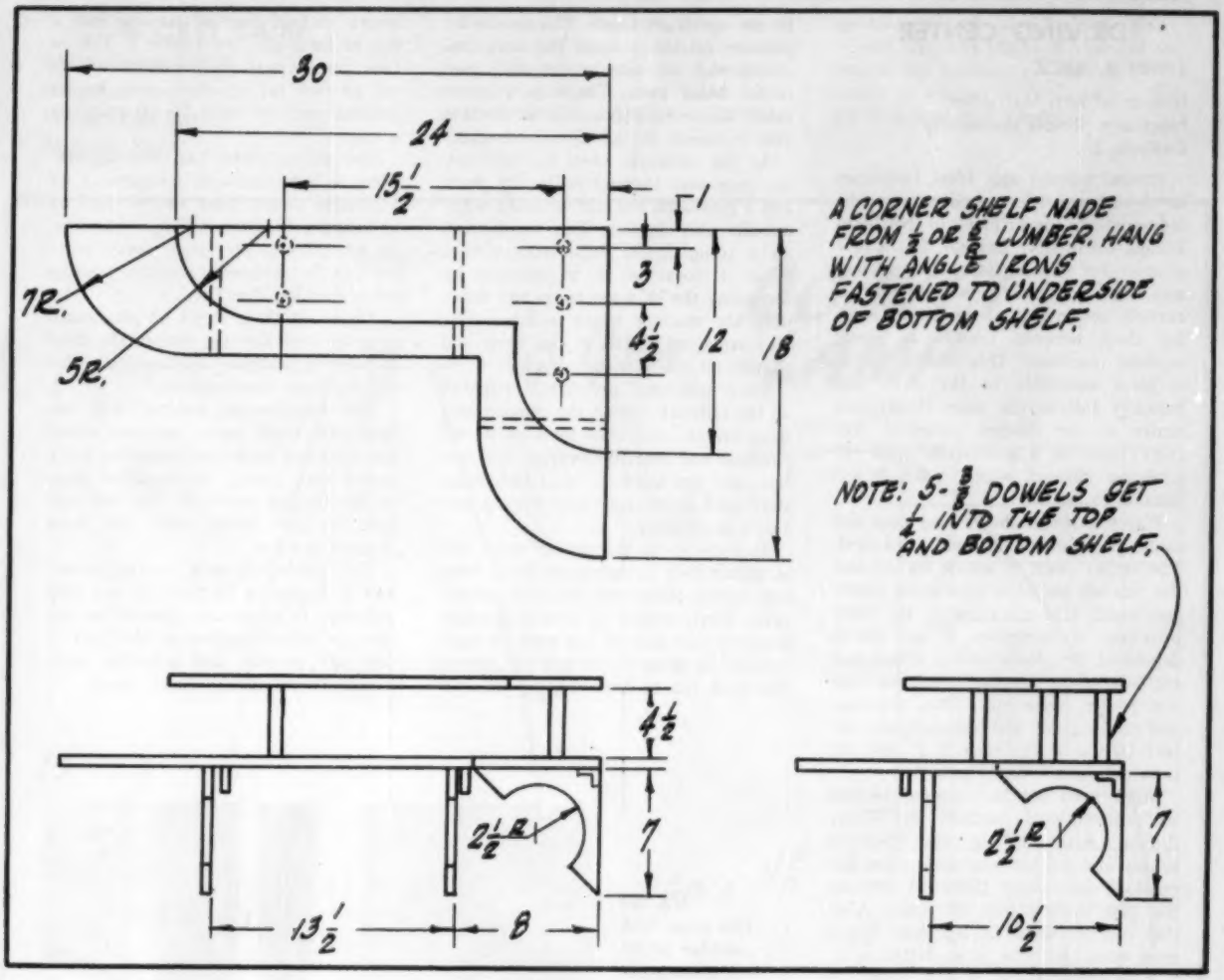
A VARIABLE SPEED DRIVE

GEORGE P. PEARCE
Albuquerque, N. Mex.

For driving small exhibition models, mechanical devices, activated Christmas scenes, watchmaker's lathes, light polishing wheels, and research apparatus it is necessary to have a variable speed drive that will provide any desired speed from a few revolutions per minute up to about 12,000 r.p.m., without the necessity of changing pulleys or gears to obtain the desired speed. The most convenient and simplest arrangement for variable speeds is a d.c. motor. One of the nice things about the d.c. motor is that first class ones equipped with ball bearings can be bought from many salvage firms for a few dollars. Many of these fine motors are designed for operation at 26 volts d.c. and this power supply can easily be provided by a small transformer and a full wave bridge rectifier, all of which are easy to assemble.

The variable speed drive I built consists of a 26 volt, ball bearing, d.c. motor which requires two amperes to give 1/20th horse power. I estimated there would be a 6 volt drop through the rectifier and to provide the required voltage I purchased a small transformer, 120 volts primary and 32 volts at 2 amperes secondary. For rectification a 35-volt, 2-amp., full wave bridge selenium rectifier is used and for the speed control a 100-ohm, 50-watt rheostat is used and these parts together with miscellaneous fuses, switch, wire, screws, etc., are indicated in the accompanying drawing shown.

For my use I needed the power drive to be handy and portable so I assembled everything in a 4 by 9 by 6½ in., high cabinet and wired it as indicated in the schematic diagram. See Figure 1. The power drive end is provided with a row of air inlet holes under the pulley to vent and keep the interior cool. Two heated air outlets are also provided and are shown at the top of the box. NOTE: Be sure to keep the motor dry and do not forget to oil the bearings occasionally.



Corner shelf — Plan III

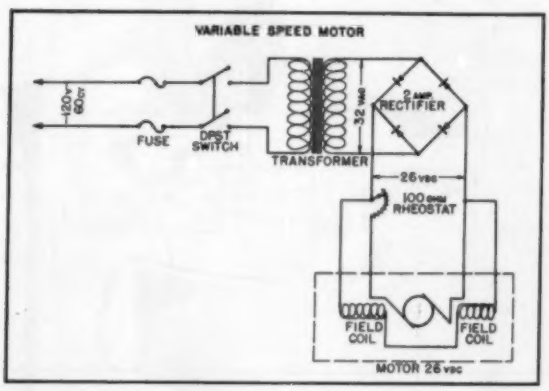


Fig. 1

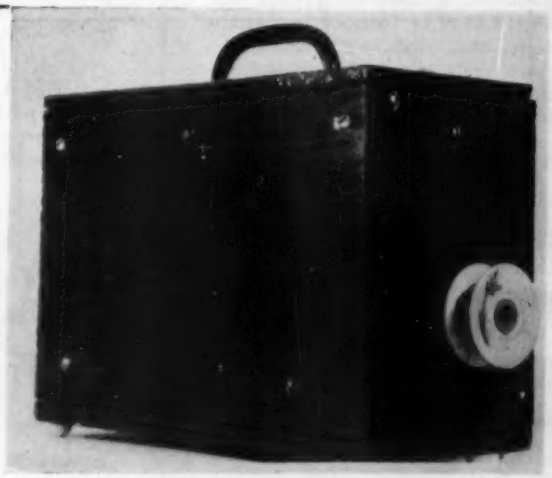


Fig. 2

DRIVING CENTER

JOHN R. BECK

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Northern Illinois University
DeKalb, Ill.

Several months ago, Ideal Industries in Sycamore, Ill., submitted to the industrial-arts department of Northern Illinois University, DeKalb, Ill., a new product for examination. This product was a driving center which provides an entirely new means of driving or holding stock between centers on metal working machines. This driving center is most adaptable to the lathe and basically follows the same theory and design as the driving center or live center used on a wood lathe with engineering changes which make it applicable to metals.

Figure 1 shows the driving pins and center point which are high speed steel. The center point is spring loaded and the pins are seated in a common plastic pad which acts according to the basic principles of hydraulics. If one pin is depressed, the plastic acts as a fluid and exerts pressure on the remaining pins and pushes them out. Thus, the pins and center point will automatically adjust to the work, even if it has not been cut square. See Figure 2.

Stock need not be prepared beyond the conventional method of center drilling. After drilling, the stock is simply inserted between centers and the tailstock handwheel tightened, causing the pins to bite into the work. Also, this can be done in complete safety even when the lathe is in motion.

A question arises at this point. In order to drive the work, doesn't a great deal of pressure need to be exerted on the tailstock which in turn is transmitted through the work to the spindle bearings? The center was not given extensive controlled tests, but it was found that although the tailstock hand wheel had to be tightened to a greater degree than used in conventional between center turning, no greater mechanical advantage was required beyond that which could be exerted manually by the operator's hands. The amount of pressure needed to drive the work also varied with the size of the stock and center being used. There is a stress safety factor built into a lathe which is able to absorb the additional pressure.

As the tailstock wheel is tightened, the pins seat themselves in the work and a maximum cut can be taken without the pins slipping. This was proved on a 16-in. South Bend lathe with a piece of stock two in. in diameter by increasing the chip thickness and depth until the machine began to labor. The pins remained seated in the work and showed no indication of slipping.

Since additional pressure is required on the tailstock center, the conventional dead center cannot be used as it will overheat and scar. Ballbearing live centers, also produced by Ideal Industries, were used in the tests and worked perfectly in all cases.

In addition to the center being able to adjust itself to unsquared stock, there are several other very desirable advantages. First, setting up time is reduced, since no faceplate or dog need be used. Second, by using the proper size center, the work can be turned along its total length without fear of running into a dog or faceplate. See Figure 2. This in turn, conserves stock, and short ends do not go into the scrapbox, since no allowance need be made for clamping on a dog.

The driving center has other applications in industrial-arts laboratories or vocational shops. They can be used on an indexing head for milling or grinding. In an indexing operation, every other pin can be reversed to insure positive drive in either direction.

There are three types of pins available for each driving center. The head is made in a variety of diameters with various taper combinations.

The experienced teacher will undoubtedly recall many instances where the described method of mounting stock would have solved or simplified some of his turning problems. He will also look to the future with the same thought in mind.

This product is now on the market and is beginning to find its way into industry. It is the intention of the author to inform readers in the field of this new product and industrial technique. Therefore this brief report.

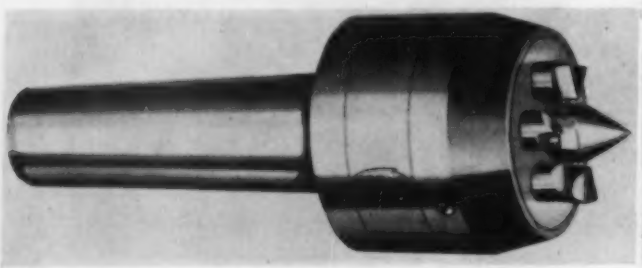


Fig. 1

Fig. 1. Driving pins and center point.

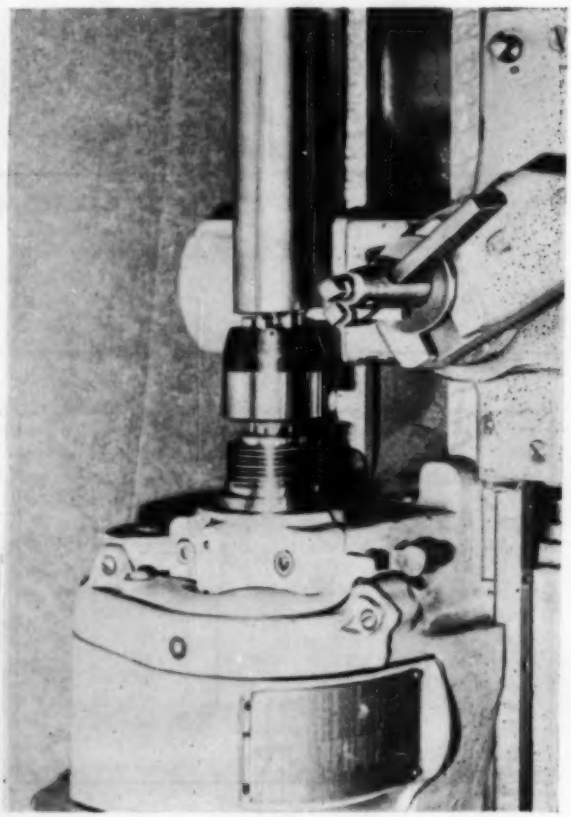


Fig. 2

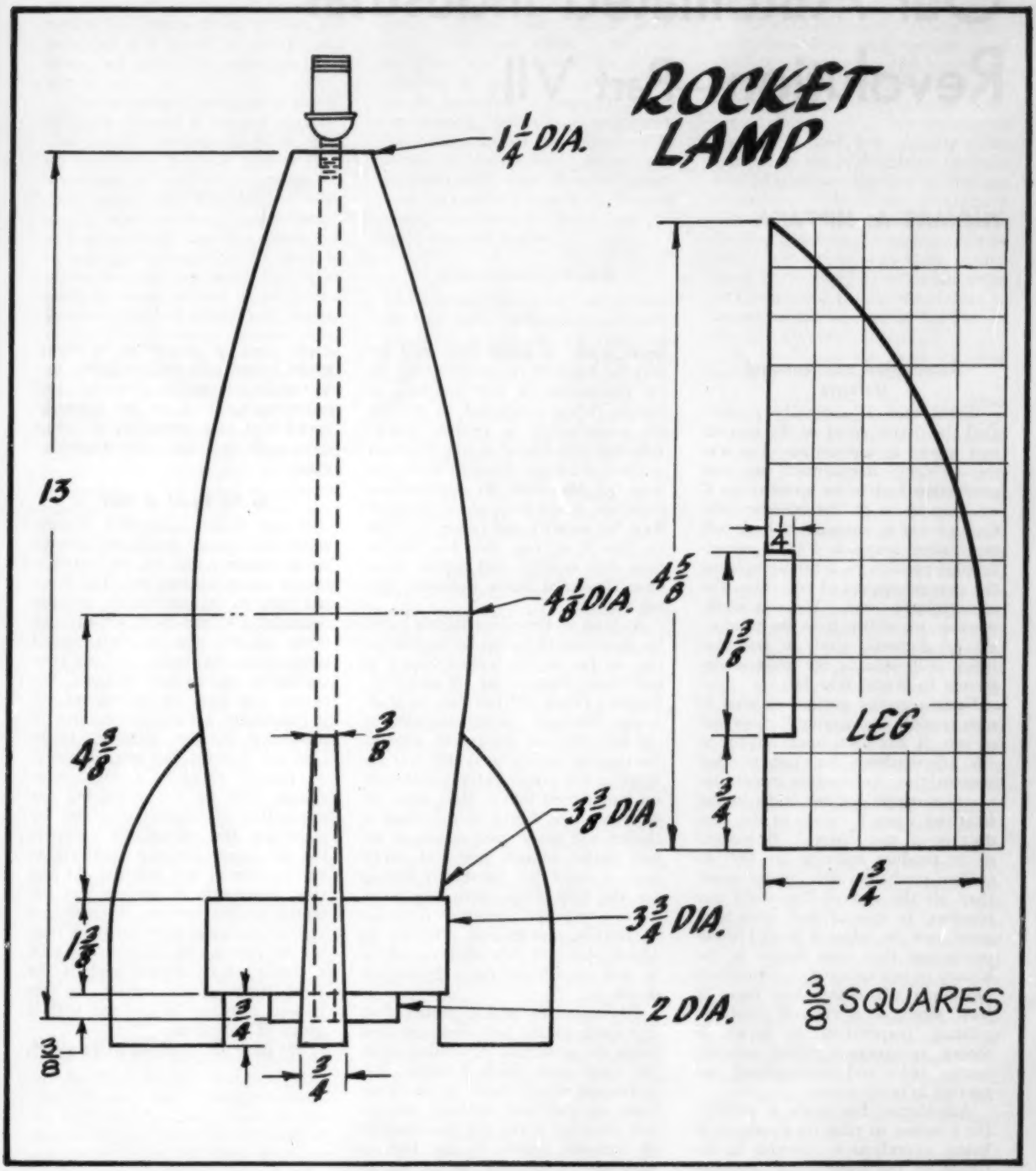
Fig. 2. The pins and center point will automatically adjust to the work, even if it has not been cut square.

ROCKET LAMP

GEORGE MISSIMER
Shop Teacher
Junior High School
Abilene, Kans.

The space age has brought out many new ideas and items used in everyday living. The rocket lamp shown herewith is constructed of native cedar. The center is turned on the lathe. The four legs also are made of cedar. See details.

Since only five pieces of material are needed, this makes a good eighth grade project of interest to youngsters in this age of rockets and missiles.



Details of the rocket lamp by George Missimer

Our Automated Industrial Revolution—Part VII

THOMAS A. HIPPAKA

Automation and National Defense

World War II naturally accelerated the development of the process now known as automation. The war was a highly mechanized one, and production had to be speeded up if we were to be on the winning side. Gains made in automation have left the United States in a most advantageous position to continue winning the genuine respect of any ruler who contemplates war. This strength, whether we utilize it in the production of domestic goods or war materiel, still remains the greatest deterrent to World War III.

Since a goodly portion of what is now termed "automation" came out of war, it has been most helpful in our preparedness for present day eventualities. Automation constitutes a major reason for our being in the forefront when it comes to the production of war materiel. It enables us to produce military, as well as civilian products, with greater speed than all the rest of the world put together. In case of war, more men could now be released from civilian production than ever before in the history of our country. Automation's peacetime advantages lose none of their significance when it comes to military preparation in terms of atomic submarines, guided missiles, bombs, radar and contemplated pioneering in outer space.

Automation has made it possible for a nation to raise its standards of living, as well as to improve its defenses at the same time. Freedom from want and freedom from fear may therefore be lessened, as humanity practices brotherhood on a larger scale. It could very well be that the Kremlin, in concentrating on the production of war materiel, is thereby being compelled to neglect the manufacture of civilian goods. Whether they like it or not, Russia's civilians must get along with far less than the Americans do. Automation, therefore, looms large as our greatest hope for security and peace, whether we like it or not. For too long a time our security and world peace have depended upon weapons, and not reason.

As long as there is a Russia ruled by gangsters, there can be no disarming, as far as the United States is concerned. Because we are prepared, Russia's rulers will not dare to start a war. We must remain prepared to the hilt, with no abatement. Due to the type of warfare in World War II, America was prepared for it, although we had lapsed into a false sense of security after World War I. Such a chance will never come again, so we had better remain prepared every hour of every day, constantly hoping for the time when, with assurance, we can revert to peacetime pursuits. Meanwhile, automation provides us added means of defending ourselves, so that we will not die a defenseless death.

Reversion to peace, should that day come during our time, can also bring its problems, depending upon the speed with which it comes. Adjustments would have to be made from an enormous military production program to the sole manufacture of domestic goods. In the face of such an unbelievable eventuality as world peace, or even consequential disarmament, and with automation speeding up our production, to preserve such a peacetime economy would indeed take self-discipline, understanding, ingenuity, character, and forbearance. It is to be devoutly hoped that in a peacetime economy there could be a high rate of employment.

In the Event of War

If war should come with Russia, which God forbid, we would have to out-horsepower her, for we certainly cannot out-manpower her. The West has come to this conclusion, and the countries involved have already cut down on the size of their armed forces most drastically, and are concentrating on nuclear weapons. We cannot slow down on automation, for it constitutes a valuable resource in producing nuclear weapons faster than the Kremlin can produce them. At present there is a very grave danger that we are sacrificing the production of defense potential by satisfying the consumer's demands for too many personal comforts at the expense of war materiel. At any rate, superiority in nuclear war potential assures survival. Without this type of sustained superiority, we may not be here at all. Hideous as such a concept may appear, such is the stark truth of the matter, as free nations continue to contend with a group of gangsters.

We have yet to prove to ourselves,

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as well as to the world, that rearmament is not essential to prosperity in a capitalistic country like ours. This will not be easy to do. In spite of the ease and rapidity with which we can produce by means of automation, our installment credit system, the consumer's purchasing power, as well as his intense desire to have the best; all will prove helpful if, and when, we return to peacetime pursuits.

The miracles of automation should never be allowed to become our god. Nor should the experts in it, with all due justice to them, become gods worshiped all out of proportion to their importance. This kind of worship is akin to a dangerous materialistic philosophy that can cause the ruination of a country. We need to remember that one good sociologist could do more for this world than a thousand experts, whose chief responsibility it is to produce modern gadgets for our greater comfort. It is about time we realized that our chief job is to get man to follow the Golden Rule before the world will be much better. To contemplate what man will do with all of his inventions, peacetime as well as military, without looking to his moral responsibilities, is indeed alarming. If men who control our hideous weapons of war, lose this sense of moral responsibility, there may be no world at all. Automation itself can prove a very dangerous development when its products are controlled by immoral men, be they civilian or military.

Automation has played an important role in preventing World War III. It has helped create such diabolical instruments of destruction that the world leaders are actually afraid to employ their own weapons. For the first time in human history men meet around conference tables, day in and day out, to discuss their differences. It is better to talk, talk, talk at the United Nations than it is to war war, war.

Capitalism and Communism are engaged in mortal combat. While the struggle continues to be a cold war, a few foolhardy leaders could make it a shooting war. Many years ago, Lenin left the world the concept that Capitalism and Communism cannot exist side by side; one or the other must go. While these two ideologies are battling for the minds of men, the cold war has a weapons phase, as well. Russia knows that we are not to be meddled with because we are ready militarily. This American readiness has actually prevented an all-out shooting war with the Russians, for they dare not start one, even if they are inclined to do so. The men in the Kremlin cannot win, and they know it. What is more, they must know that nobody can win World War III, for it would be the end of the world, as we know it.

Russia, too, has her type of automation. Why not? At the close of World War II, she kidnapped a number of the best German scientists. These men, added to her own physicists and chemists, make her scientists a formidable group. Nor has she been slow in preparing a very considerable number of engineers. She is selecting her most gifted young people to become her scientists and engineers with one thought uppermost; to fortify Russia with the most powerful weapons of destruction this world has ever known.

Automation in Russia

Like everything else, automation operates under compulsion in Russia. Industrial producton for war has priority over everything else. The government decides how much is going to be invested in capital outlay. Labor takes orders from the Kremlin. An invention can be stopped by a few men in the Kremlin. Slave labor is still employed. Fear forces men to push onward without resistance from worker or union. Through fear of imprisonment and even death, men are forced to increase production. Consumer's desires are ignored when the standardization of products means the production of goods in a longer series. Political interference is the rule, rather than the exception. Everything industrial is under government ownership and control. Consumer goods are scarce, and prices are government regulated. Workers, including scientists, engineers and technologists work where they are told to work, for they have no choice in the matter.

So there is a race involving automated productive methods between Russia and the United States. In America we cater to the consumer in terms of civilian goods, while we prepare militarily. In Russia, the Kremlin keeps the public on short consumer rations as they manufacture more powerfully military weapons. In America, people enjoy their freedom, human rights and a high standard of living. In Russia, these privileges are denied the common man. We insist that the Americans enjoy these privileges while they build adequate defenses against any and all enemies to our way of life. It is to be devoutly wished that history will some day record that America preserved her glorious way of life, as she fought a long, cold war to a successful conclusion.

The American Outlook

> Advances in technology are always ultimately beneficial, but their immediate impact is seldom painless. To understand their importance one must study both their technical nature and their social and economic significance. — *E. M. Hugh-Jones.*

The word *automation* evokes many predictions from many people as to the future of America and Americans. At one extreme is the pessimist who sees wholesale unemployment, widespread hunger with free indulgence for the marked few. At the other extreme is the high-soaring optimist who pictures an America of limitless abundance with untold pleasurable leisure, as well as boundless wealth. Neither pessimist nor optimist can be taken too seriously in their predictions. Fortunately America has many serious-minded people who refuse to become panic stricken in the face of any and all eventualities.

R. H. Macmillan gives us these words of timely caution:

> . . . replacing men by machines must increase the tension of the economic system; that is, it increases the sensitivity of some of the closed loops in the economy, which is just the sort of situation that can lead to instability.

Realistic people accept Macmillan's timely warning as they profit by the lessons learned from the past, thereby highly resolving that stability, and not instability must prevail. They further resolve that our American economy will never again go into the tailspin, so persistently predicted and devoutly wished for by the Kremlin. Nothing would please the officials in the Kremlin more than to see this happen to our capitalistic way of life, for they know, as well as we do, that the social implications of a serious depression carry disastrous consequences for us as a free nation.

Where people are kept in ignorance, or where they refuse to learn, their unfounded fears generally increase. This can very well be true concerning automation as an industrial process. Adequately informed people gain proper perspective and generally meet acute situations with courage, as well as with their better judgment. This has always been the American way. Informed, intelligent and fair-minded people know that through the years the general well being of workers has constantly improved, due largely to more efficient methods of production.

In this regard, H. Nicholas of the Transport and General Workers Union gives the worker and the country considerable assurance in these words:

I am confident that the problems attendant on automation can be solved, but only if they are *more widely known.*

Dr. Arnold J. Toynbee would have us believe that our age is the first since human history began which dares to think in terms of making the benefits of man's efforts available to the whole of humanity. He indicates further that the present century will be remembered primarily for such accomplishments, and not solely for the countless gadgets created by man in his industrial wisdom, important as these achievements are.

Technical assistance in the form of know-how and equipment sent from America to other peoples has contributed very greatly to the partial realization of Toynbee's observations. All of this can mean that world competion will grow keener, and that American production will have to improve continuously, if we are to remain in the vanguard of global production and world trade.

Automation in America can very well mean that more people can have the comforts of life, but these comforts must be earned ones, accompanied by job satisfaction and self respect. Automatic production can very well mean that greater factory output will provide more people with the essentials of life through reduced costs, thereby creating even greater demands so that more people can enjoy full employment.

Automation can multiply the means of making real human values more attainable. It will continue to eliminate back-breaking jobs and unhealthful working conditions. The work week may be shortened even more, providing greater leisure time for people. Parents can spend more time with their families, a much hoped for turn of events. Scarcity of labor can be relieved. More people will enjoy more goods at nominal costs, all of which can result in greater consumer demands for products of various kinds. This being true, there can be greater opportunities for workers of various kinds, resulting in new heights of employment, thereby alleviating the fears of unemployment. The realization of these more favorable conditions will make machines the friends of humanity, and not their foes. Machines can and must become the servants of men; human beings must never allow themselves to become the slaves of their machines.

The second section of part VII of Dr. Hippaka's article — discussing the social adjustment needed for the age of automation — will be presented in the October issue of IAVE.

Development of Electronics

Rapid changes must be made in the education of our youth in order better to meet the needs arising from the growth of electronics. This means that the public school must put greater emphasis on electricity and electronics.

From its modest beginning electronics developed rapidly until it has become a multi-billion dollar industry. We are surrounded with electronic marvels such as the telephone, radio, and television, with each year bringing other developments.

Within ten years the radio became a household necessity, but perhaps the most striking example of progress in the electronics field is the strides made in television. While much research and development work was conducted over the past thirty years or so, it is only since World War II that television has developed into a multi-billion dollar industry. In 1945 only three television stations were on the air. About two thousand stations are now in existence. Authorities believe every community in the country will be in range of a television transmitter within a short time.

Skilled technicians have a bright future in electronics. They are needed in plants, laboratories, research, and sales and service. Persons are needed who can install, operate, and maintain the various electronic devices used. The background in electricity and electronics needed by these technicians must be provided by the schools.

The application of electronics to industry is becoming increasingly well known. Many plants, large and small, use electronic controls to perform a wide variety of production tasks. These devices count, sort, measure, grade, inspect, control, and do countless other operations quickly, efficiently, and with great safety.

There are automatic bakeries where machines receive the bread ingredients, mix the dough, shape it. cut it into loaves, put the loaves into the ovens, take them out, slice them, wrap them in cellophane, pack them into boxes, seal the boxes, and deliver them into waiting trucks.

Giant factories are designed to receive three kinds of raw materials: sheet metal, cardboard, and foodstuffs. These miracles of automation cut the metal, put ends on it, roll it, solder it, prepare the food, put the food into cans, extract the air, seal the cans, label them, turn the cardboard into boxes, seal them, address them, and load them into railroad flat cars.

Plant management officials are finding electronic control devices effective for speeding production and cutting costs. From this begins another new field — automation electronics. This system automatically controls machines output and quality of products.

Though these automatic machines replace many workers in the factories, they in turn require operators and maintenance. Everywhere electricity and electronics is being used more and more. This means that more people are needed to install, design, and repair these items. There are increasing vocational opportunities ahead in the field of industrial electronics.

The sales volume of nine billion dollars achieved during 1955 in electronic devices led one leading manufacturer to predict a rise of twenty billion dollars in the next decade.

Of the 500 largest industrial concerns in the United States, each with annual sales of fifty million dollars and over, 101 have some interest in the electronics business.

In 1956, electronics, the fourth largest industry in the United States, employed 1.7 million persons. Seventy-five per cent of these persons work at jobs which did not exist ten years ago.

Exactly what the future holds in electronic developments seems to be limited only by human imagination.

In view of the increasing industrial use of electronic manufacturing processes and the electronic home equipment which will be in common usage in a short time, greater emphasis must be placed on preparing students to live in this electronic age.

The public school cannot provide this training unless the teacher training institutions offer more and better courses in this area for the high school teachers in industrial arts.

— **Troyce D. McGovern**
Instructor, Department of Industrial Arts, Southeastern State College, Durant, Okla.

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PERSONAL NEWS

(Continued from page 4A)

Mr. Ziegenhagen played a major role in reorganizing the course, which today, in many respects, is considered tougher than the curriculum in some other city high schools.

In 1933 Mr. Ziegenhagen was appointed vice-principal under Mr. Thomas Brown. When Mr. Brown retired in 1945, Mr. Ziegenhagen was elevated to the principalship. He has been the recipient of many honors during the years of service to education in Milwaukee. Just recently, in recognition of his outstanding service to the Milwaukee Foreman's Safety School, he was presented with a certificate by the Milwaukee Association of Commerce. The presentation was made at a special dinner at the Milwaukee Auditorium on May 20, 1959.

He is the second oldest principal in point of service in the Milwaukee school system, having served in that capacity since 1945.

In his farewell remarks, Mr. Ziegenhagen says:

"I must admit that after serving an institution for almost 45 years it is going to be rather hard to separate oneself completely from its activity. Therefore it is my ambition to do whatever I can to help Tech build a still finer school. In fact I have already accepted an offer from the superintendent to come in for consultation regarding the school's building program. So it won't be as if I'm going to be completely disassociated with the school."

MR. HARTMAN RETIRES

Harry V. Hartman, who was a member of the industrial arts faculty of Kansas State College of Pittsburg, Kans., for 39 years, is retiring at the end of the summer term. He taught auto mechanics and introduced the first course in teaching of teachers of driver education in the Pittsburg institution many years ago.

Mr. Hartman taught what is believed to have been the first class in Kansas in auto mechanics in the high school at Altamont, Kans., in 1918 when he rounded up a class of young boys, most of them farm boys, and set up a shop course while teaching in the high school there.

In 1920, he became a member of the college faculty at Pittsburg and began teaching teachers of auto mechanics. From this work, his course in teaching teachers to teach driver education came about.

In the beginning many high schools in this area were extremely cautious about teaching driver education with the result many stumbling blocks had to be overcome. Now, however, almost all schools in the area have classes in driver education, many of them having teachers who are graduates of Mr. Hartman's classes.

He received his bachelor's degree from Pittsburg and his master's degree from Iowa State College. During World War II while a faculty member at Pittsburg, he taught glider, liaison, and Navy V12 pilots and gave instruction in aircraft and engineering instruments.

EUGENE J. ROBINSON RETIRES

Eugene J. Robinson, supervisor of industrial arts for Dayton, Ohio, public schools for the last 23 years, retired on June 13, 1959.

He was born at Rockford, Ohio, in 1894, and graduated from Stivers High School, Dayton. He received his B.S. from Miami University.

Mr. Robinson has been in the industrial-arts field in the Dayton schools system for 46 years, and spent the years from 1913 to 1939 as a teacher at Stivers, Steele, and Roosevelt High Schools.

He was at one time president of the industrial-arts section of the Ohio Education Association, and a member of the executive committee, for five years, of Ohio Industrial Arts Association.

James O. Reynolds has been named as his successor. He is a Belmont High School teacher of shop and drafting, and has been with the Dayton system since 1947. Before that he taught at Caledonia and West Alexandria.

DR. J. EDGAR RAY RETIRES

Dr. J. Edgar Ray, a member of the faculty of Stout State College, Menomonie, Wis., as professor of industrial education and head of the department of drafting, retired in June, 1959.

Dr. J. Edgar Ray

Dr. Ray came to Stout as a bricklayer to work on one of the campus buildings, and stayed 45 years. Although he is now considered the only union bricklayer in the United States with a doctor's degree, his preparation in 1914 was that of the average journeyman bricklayer who had practiced his trade in eight states, from New York to California, and from Michigan to Texas.

The late Dr. L. D. Harvey, president of the then Stout Institute, persuaded Mr. Ray to leave a bricklaying job in Philadelphia and travel to Menomonie for an interview about teaching his trade to students at Stout, which at the time had not yet become a degree-granting college. Mr. Ray consented and Dr. Harvey convinced him to take the teaching job, with the prospect of some added income laying brick on the Stout's new home economics building. Then Mr. Ray enrolled in the teacher's course at Stout, with the result that he earned one of the early bachelor of science degrees in industrial education granted there. In 1930 he completed his master of science at Iowa State University, and in 1944 he was granted his doctorate by New York University.

By conservative estimate, J. Edgar Ray has taught at least 8400 students, including the present president of the college, Dr. Verne C. Fryklund, and nearly every administrator and teacher now on Stout's industrial education faculty.

At various times he has taught bricklaying, architectural drafting, machine drafting, freehand drawing, and concrete working. For three years, because of his talent as a musician, he directed the Stout band. He has written two textbooks, *The Art of Bricklaying* and *Graphic Architectural Drafting*, both used nationally, plus articles for professional magazines and bulletins for the Wisconsin State Board of Vocational and Adult Education.

In his 45 years on the campus, Dr. Ray has worked with all three of Stout's presidents and four directors of the school of industrial education.

Besides enjoying a variety of interests including instrumental and vocal accomplishments, outdoor photography, fishing, swimming, and boating, he kept his bricklayer's union card in good standing by working during the summers on several local buildings, and laying up fireplaces and outdoor grills for friends.

He is a member of Epsilon Pi Tau national honorary industrial arts organization, Phi Delta Kappa, and the Association of Wisconsin State College Faculties.

DR. HALL RETIRES

Dr. J. Alfred Hall will retire August 31 as director of the U. S. Forest Products Laboratory at Madison, Wis., and will be succeeded by Dr. Edward G. Locke, chief of the world-famed institution's division of wood chemistry for the past 8 years.

The retiring director will take up residence in Portland, Ore., where he will do consulting work for industrial concerns in the forest products field.

HOMER C. ROSE IN NEW POST

Homer C. Rose has been named Chief, Management Training and Training Development Branch, Training Division, Federal Aviation Agency, Washington, D. C.

Previous experience includes that of Chief, Proficiency Development Division, Personnel Office, Civil Aeronautics Administration; Senior Training Specialist, Office of Director of Training, U. S. Navy; Head, Curriculum and Instructor Training Section, Bureau of Naval Personnel; Officer-in-Charge, School Curriculum and Instructor Training Program, Navy Amphibious Training Command, World War II; Instructor Trainer, Fort Knox Armored School, U. S. Army, and Professor of Industrial Education, Southern Illinois University.

Mr. Rose holds the degree of B.S. from Stout State College, master of science from Iowa State College with additional work in psychology and administration at New York University.

As a commander, U. S. Naval Reserve, his most recent training assignments have been with aircraft carrier antisubmarine warfare operations.

He is also dean of the faculty, Naval Reserve Officer School, Washington, D. C.

EARL L. BEDELL

Earl L. Bedell, former divisional director of vocational education of the Detroit Public Schools, has been appointed to direct the educational activities of the Society of Reproduction Engineers by recent action of the Society's Board of Directors.

Mr. Bedell will co-ordinate the work through educational committees of the local chapters in a well-planned program to support local schools in their preparation of young people for the graphic reproductions industries. He will also work with colleges and technical institutes in establishing technical courses of training for supervisors and techncians in graphic reproduction. A comprehensive educational program for the industry is also being prepared.

The education activities of the Society will be directed from the national headquarters office of the Society of Reproduction Engineers, 10525 Puritan Ave., Detroit 38, Mich.

(Continued on page 22A)

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PERSONAL NEWS

(Continued from page 20A)

DR. STRONG IN NEW POSITION

Dr. Merle E. Strong, Ohio consultant for the Trade and Industrial Education Curriculum Materials Development Laboratory at The Ohio State University for the past four years, resigned May 15, 1959, to accept a position in the Trade and Industrial Education branch of the United States Office of Education in Washington, D. C., effective on June 1.

During Dr. Strong's four-year term he more than doubled the services of Ohio's Curriculum Laboratory. His Ph.D. dissertation involved a study of organized curriculum materials development in the various states.

Dr. Strong was formerly local supervisor of Trade and Industrial Education in Sandusky, Ohio.

P. M. RICE IN NEW POSITION

Philip Morrison Rice, professor of history and director of the summer session for North Carolina State College, has been named professor and head of the department of history, government, and philosophy at Kansas State University, Manhattan, Kans.

His appointment is effective September 1, 1959. He takes over the position formerly held by Fred L. Parrish, who has, under a Board of Regent's ruling, relinquished administrative duties at the age of 65.

Mr. Rice's professional interests have been in the field of economic history and he currently is engaged in work on a comprehensive history of transportation in the United States. He has received a number of research grants, including two from the Ford Foundation for the presentation of information on the Soviet Union through television.

DR. KEZIOS IS CHAIRMAN OF ASME

Dr. Stothe P. Kezios, professor of mechanical engineering at the Illinois Institute of Technology, has been elected chairman of the Chicago section of the American Society of Mechanical Engineers.

He has served as vice-chairman of the Chicago section the past two years and at present is chairman of the heat-transfer division of the national ASME.

An alumnus of Illinois Tech, Dr. Kezios is director of IIT's heat transfer laboratory.

DR. DUNNING PROMOTED

Dr. William Dunning, instructor of drafting in the industrial-arts department, Division of Applied Arts, Fresno State College, Fresno, Calif., has recently been promoted from associate to full professor.

Professor Dunning is a member of the Graduate Committees for both the college as a whole and for the industrial-arts department. His doctorate was earned at the University of North Dakota in 1956.

MR. BERNDT EMPLOYED AS CONSULTANT

William Berndt, formerly local supervisor of Trade and Industrial Education in Van Wert and Steubenville, Ohio, was recently employed as consultant in Curriculum Materials Development for Trade and Industrial Education.

Mr. Berndt holds both his bachelor's and master's degrees from The Ohio State University.

During the past six years Mr. Berndt had operated his own wholesale lumber business in the Steubenvile area.

Mr. Berndt's new address is Trade and Industrial Education Services, The Ohio State University, 1885 Neil Ave., Columbus 10, Ohio.

OMAR H. DAY

Mr. O. H. Day, who for 35 years was active in the field of industrial education, is now associated as manager of School Sales with W. P. Stark Lumber Company, Fairfax Industrial District, Kansas City, Kans.

Mr. Day is a native of Indiana, and a graduate in mechanical engineering from Purdue University. He received his master's degree in industrial education from Colorado State University at Fort Collins, and did additional graduate work at Teachers College — Columbia University, Indiana University, and Kansas University.

In his years of teaching he spent four years on the faculty of Purdue University training teachers of industrial education, and twenty-four years as director of vocational education of the Kansas City, Mo., public schools.

He was executive officer on War Production Training and Veterans Training in

(Continued on page 24A)

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PERSONAL NEWS

(Continued from page 22A)

Kansas City Public Schools during World War II.

Mr. Day spent fifteen years in industry in engineering and personnel work.

The W. P. Stark Lumber Company are suppliers of domestic and imported hardwood and softwood lumber, plywood, and other related specialities for industrial education shops and classes.

DR. WILBER VISITS OSWEGO

Dr. Gordon O. Wilber, retired chairman of the Industrial Arts Division at State University Teachers College, Oswego, N. Y., and Mrs. Wilber recently visited Oswego before returning to the Philippine Islands where Dr. Wilber is continuing a project which is promoting a growing industrial-arts program there.

He has completed a two-year assignment as a team leader of a Stanford University-International Cooperation Administration-Philippine Department of Education contract in industrial-arts teacher education at the Ilo Ilo School of Arts and Trades.

Dr. Wilber commented that the progress has been gratifying, in spite of the great economic obstacles to the program. The goal of the team is to upgrade preparation of industrial-arts teachers for the Philippines.

Dr. Wilber's new one-year assignment is in connection with the same project, but he will work in Manila at the Bureau of Public Schools. His goal will be to spread ideas and curriculum developed at Ilo Ilo throughout the entire nation.

One of the improvements made in the Philippine Industrial Arts Teacher Education curriculum by Dr. Wilber's team was the initiation of the off-campus practice-teaching system, used at Oswego and other American industrial-arts teacher preparation colleges.

A member of Dr. Wilber's team during the past two years has been Dr. William Huss, professor of industrial arts at Oswego, who took part in the program during a two-year leave from the college.

He left San Francisco on June 1, before which he reported to the project coordinator, Dr. Paul Hanna, at Stanford, and briefed a member of a new team which will work this academic year at Ilo Ilo.

ARTHUR HAULER, EDUCATOR, RECEIVES AWARD

Arthur Hauler, chairman of the Department of Industrial Arts Education at State University Teachers College, Oswego, N. Y., recently became the recipient of the highest award given by the New York State Steering Committee for Industrial Arts, a section of the New York State Vocational and Practical Arts Association.

The Committee made the award to Mr. Hauler at its annual meeting in New York. Called the Outstanding Service Award, it is given annually to the person who has made the greatest contribution to industrial arts in New York State. Mrs. Hauler was on hand to see her husband receive the honor.

One of his greatest contributions to industrial arts was the initiation of the college's off-campus student teaching program for industrial arts. Mr. Hauler started the first co-operating student teaching centers in 1925, with two centers, one

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at Oswego High School and the other at Hannibal High School. There are now about 100 centers in a wide area of the state bordered by Massapequa on Long Island, Brockport, Adams Center, and Binghamton. The Oswego Industrial Arts Student Teaching Program has set a pattern which has since been studied and copied nationwide.

Mr. Hauler received his B.S. degree from the University of New Hampshire in 1921, and taught industrial arts in the elementary schools, and then was appointed a city director of industrial arts in Bangor, Maine. He joined the Oswego staff in 1925, and since has made available to all his consultant and advisory services to undergraduates, graduate students, and alumni of Oswego and others in the corps of New York State industrial arts and vocational-industrial instructors.

Each year Mr. Hauler serves as coordinator for industrial arts and vocational programs during Oswego's summer session, and is instrumental in working with conference chairmen and those planning summer workshops at the college campus.

He is a member of the New York State Teachers Association; the New York State Vocational and Practical Arts Association; the American Industrial Arts Association; American Vocational Association; the Association of State University Teachers College Faculties; and honorary life member of the Syracuse Industrial Education Club. the Central New York Industrial Arts Club, and Mohawk Valley Industrial Arts Club. These honorary life memberships were presented at a testimonial dinner held in 1956 when by vote of the membership in the three associations Mr. Hauler was voted Mr. Industrial Arts of New York State.

DR. SILVIUS WAS GUEST AT KENTUCKY

Dr. G. Harold Silvius, chairman of the Department of Industrial Education, Wayne State University, Detroit, Mich., was a guest of the Industrial Arts Department, Eastern Kentucky State College, Richmond. Ky., in spring.

During his visit, Dr. Silvius spoke at a dinner meeting sponsored by the Eastern Industrial Arts Club. His presentation, "Industrial Arts in the 20th Century," was delivered on the evening of April 14 before a large group composed of college students, industrial-arts teachers of the Central Kentucky area, staff members of the industrial-arts department, Berea College, and the Department of Industrial Education, University of Kentucky, and representatives of the State Department of Education.

While at Eastern, Dr. Silvius met with the staff members of the Industrial Arts Department and discussed current problems related to the training of industrial-arts teachers. On April 15 he visited the Industrial Arts Department of nearby Berea College, and toured the recently completed Danforth Industrial Arts Building on Berea's Campus.

On April 16, Dr. Silvius was guest speaker at the annual meeting of the Industrial Arts and Trades and Industries Sections of the Kentucky Education Association. The meeting was held at the Sheraton-Seelbach Hotel in Louisville, Ky.

♦ Dr. T. Paul Torda has been named director of propulsion and fluids research at Armour Research Foundation of Illinois Institute of Technology, Chicago.

Formerly Dr. Torda was professor of mechanical engineering at the Polytechnic Institute of Brooklyn, New York.

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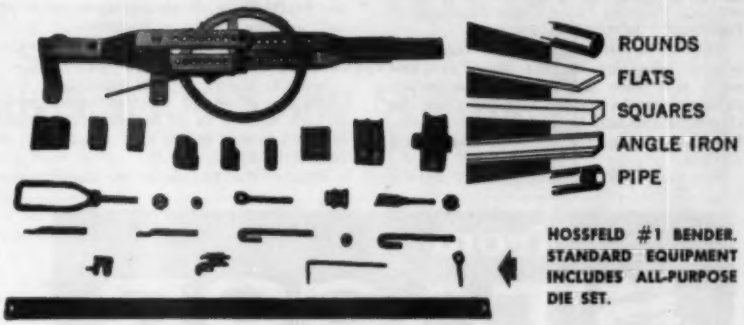

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New Publications

Rehabilitation Centers Today

By Henry Redkey. Soft cover, 231 pp., 5⅞ by 9 in., illus., $1. U. S. Department of Health, Education, and Welfare, Government Printing Office, Superintendent of Documents, Washington 25, D. C.

This book on rehabilitation centers is written especially for the many communities that have either established centers or are eager to do so. It reports on the characteristics and services of 77 rehabilitation centers in the United States and Canada.

The book has been brought out by the Office of Vocational Rehabilitation to help meet the need for specific information on costs, program, services, staffing, referrals, disability groups served, and management. Developed in co-operation with the Conference of Rehabilitation Centers, the book takes a threefold approach to the problem of presenting a wealth of detailed information. First, the centers studied are discussed as a group, with attention to trends and practices in concepts, program, staffing, and services against a backdrop of many years of experience with centers in this country.

Second, about 20,000 individual facts about the 77 centers are recorded in tables in such manner as to facilitate comparison between centers on an over-all program or specific items.

Finally, the 77 centers are listed alphabetically by state and city with pertinent information about each, such as the specialty of medical director, number of professional staff, case load, disabilities served, waiting lists, and training affiliations.

A Diderot Pictorial Encyclopedia of Trades and Industry

By Denis Diderot. Cloth, 485 pp., 9¼ by 12¼ in., plates — two volumes. Ten dollars per volume, $18.50 for the two-volume set. Dover Publications Inc., New York, N. Y.

This encyclopedia was first published in France in the 18th century shortly before the Industrial Revolution.

Artists, illustrators, and historians will be delighted with the 485 Diderot plates selected by the Dover Publications to illustrate this edition.

The two volumes of plates cover manufacturing and the technical arts. There are 56 plates on agriculture and rural arts, 15 plates on military arts, 40 dealing with the iron foundry and forge, 43 covering the extractive industries, 44 on metal working, 67 on glass working, 28 on masonry and carpentry, 55 on textiles, 28 on papermaking and printing, 14 on leather, 28 on gold, silver, and jewelry, 18 on fashions, and 39 on miscellaneous processes and operations, such as soapmaking and building canals.

Design of Plumbing and Drainage Systems

By Louis Blenderman. Cloth, 320 pp., 6⅛ by 9¼ in., illus., $7. The Industrial Press, New York, N. Y.

The author of this book has had over 20 years of experience in designing the plumbing and drainage systems in all types of buildings, especially in hospitals, laboratories, and institutional establishments.

The book contains basic design data, plumbing codes, footing drains and drainage basins, subsurface water conditions, manhole design, access space for plumbing fixtures, fixture roughing for low rent housing projects, vent stacks, preventing sewage backflow, sump pumps, cleanouts — interior and exterior, access for building traps, hot and cold water service, external indirect water heaters, economy in service hot water generation, water hammer arrestors, interception of volatile liquids, expansion in hot water piping systems, increasing water supply pressure in buildings, gas service, first aid fire protection, parking area drainage, storm drainage system for flat roofs, water service for research laboratories, emergency devices for protection of laboratory personnel, drinking water systems, distilled water systems, plumbing systems for motels, water and drainage systems for barns, and draining planting areas.

Rehabilitation Center Planning

By F. Cuthbert Salmon and Christine F. Salmon. Cloth, 164 pp., $12.50. University of Pennsylvania Press, University Park, Pa.

Educators in the field of vocational and industrial arts education will welcome this technical work which provides for them an insight into the complicated problems of planning and equipping centers for the care and training of handicapped children, youth, and adults. Schoolmen have always approached the problem of caring for the handicapped as a challenge because they believe that education can do much to restore "the handicapped to the fullest physical, mental, social, vocational, and economic usefulness of which they are capable." While this book is devoted to the overall planning of sites and buildings and to the planning of activity areas for medi-

(Continued on page 28A)

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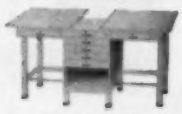
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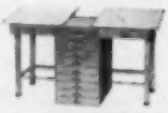
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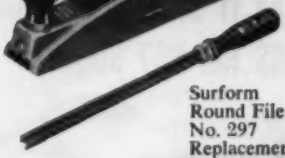

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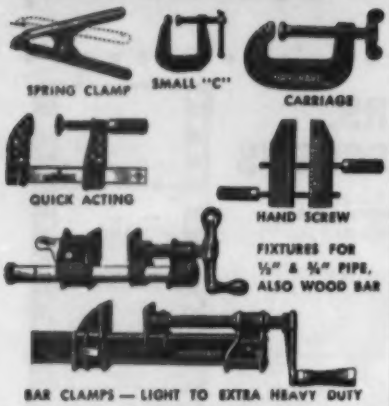

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NEW PUBLICATIONS

(Continued from page 26A)

cal, vocational, and other forms of treatment, considerable attention is given to the fact that these centers, their staffs, and every last piece of equipment are provided for the welfare of the patients and so far as possible their ultimate social and economic independence. The layouts of workrooms and instructional areas are particularly effective and will provide some ideas for the schoolman who is planning shops for normal children. The suggestions for guidance for social — vocational — medical adjustment are rather informal but will give the schoolman an insight into the medical and social work viewpoints.

Building Construction Estimating

By George H. Cooper. Cloth, 398 pp., $7.50. McGraw-Hill Book Co., New York 36, N. Y.

This second edition of a book which has been widely used since 1945, introduces the prospective estimator into the basic methods of figuring the costs of doing all the work — carpentry, masonry, cement work, roofing, finishing, etc. — on smaller buildings, e.g., houses and garages — and leads into the methods of figuring quantities and labor costs on larger buildings. Use is made of present-day prices and labor rates.

Sheet Metal

By Leroy F. Bruce. Cloth, 265 pp., $4.60. American Technical Society, Chicago 37, Ill.

This is the second edition of a book widely used by vocational classes and experienced journeymen. It is of the manual type with logical presentations of (*a*) the materials and tools of the trade, (*b*) the common procedures of forming sheet metal, (*c*) the applied principles of pattern development, (*d*) triangulation and short cuts in pattern development, (*e*) welding methods applied to sheet metal. The new sections of the book include additional material on triangulation made necessary by the growth of the ventilation and air-conditioning industry, a new chapter on the "rollation" short cut method of pattern development. A new introduction acquaints the reader with the growing economic opportunities of sheet-metal work.

The First Book of Color

By Herbert P. Paschel. Cloth, 45 pp., $1.95. Published by Franklyn Watts, New York 22, N. Y.

This book is a very simple introduction into the theory and the practical use of color in printing and the simpler forms of industrial designing. Young people will enjoy the book because it explains not merely the theory of light and its application to color but also the practical development of color combinations and four-color engraving. The author is a practical colorist who has taught the subject in vocational schools and has an understanding of the practical aspects of the subject from the standpoint of photography, four-color engraving, and lithography.

More About the Backward Child

By Herta Loewy. Cloth. 138 pp., 5¾ by 8¾ in., $4.75. Philosophical Library, Inc., New York, N. Y.

The author of this book has written two other books to guide parents and teachers in helping the backward child. The book explains what the author has done under various conditions to help backward children to overcome their various troubles.

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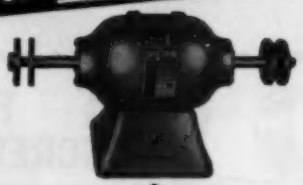

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COLUMBIA-HALLOWELL CATALOG

A new four-color 16-page catalog on its Nine-To-Five office furniture line has been released by the Columbia-Hallowell Division of Standard Pressed Steel Company, manufacturer of steel office furniture, shelving, and steel shop equipment.

Full-color illustrations show the various types of work stations that can be formed with Columbia's Nine-To-Five line. The catalog points out 16 extra quality features found in the units, including such items as one-piece wrap around desk pedestals, telephone equipment mounting boards on back panels, and fully interchangeable drawers in pedestals.

In addition, instructions are given on how to plan an office, making full use of available space with Nine-To-Five.

Columbia's popular Designer's Unit, a combination desk and drawing board, is also illustrated in full color.

The catalog is available upon request.

(For further details encircle index code 0723)

DESCRIPTIVE FOLDER

Buck Engineering Company, Inc., have made available a four-page 8½ by 11-in. folder in two colors describing the complete line of Lab-Volt Power Stations for science labs and shops.

This literature gives complete electrical information on each of six independent models designed to meet all electrical current needs, both a.c., and d.c., for science experiments.

Typical science classroom layouts are shown as well as illustrations of typical lab furniture showing table top and recessed installations of appropriate Lab-Volt Units. Price information is included.

(For further details encircle index code 0724)

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SAMS PUBLICATIONS ANNOUNCED

The Audio Cyclopedia, by Howard W. Tremaine, D.Sc., FAES, Catalog No. ACT-1, 1280 pp., 6 by 9 in., hard-bound, 354 half-tones, 1300 line drawings, $19.95.

A major scientific reference volume and working guide. The Audio Cyclopedia completely covers every phase of audio, including latest data on stereo. The 1280-page volume contains answers to more than 3400 separate questions on audio. Any audio subject can be easily found from the 54-page index by means of a unique chapter and paragraph numbering system.

The Audio Cyclopedia will prove to be invaluable to engineers, serious audiophiles, recordists, service technicians, research scientists, technical libraries, students; to those in motion picture work, broadcasting, maintenance of inplant audio equipment, etc.

Tape Recorder Manual, Vol. 4. Catalog No. TR-4, 160 pp., 8½ by 11 in., $2.95.

Tape Recorder Manual, Volume 4, contains a special editorial section on "Magnetic Recording Tape" covering such important topics as: the recording process, tape composition, manufacturing trends, magnetic tape characteristics, test procedures, care of tape and tape usage.

This is followed by complete Photofact Service Data coverage of 21 models of 1958–59 tape recorders including brand-name units, such as: Bell & Howell, Bell Sound, Grundig Majestic. Knight, RCA Victor, Revere, Sylvania, Telectro, and Tower.

Data on each model is prepared by laboratory analysis of the actual equipment in the Sams laboratories and includes Photofact famous "exploded view" diagrams, electrical and mechanical parts list, cabinet and chassis photographs, standard notation schematics, operating and maintenance instructions, adjustments required, and trouble-shooting charts.

Television Antenna Handbook, by Jack Darr. Catalog No. TAD-1, 248 pp., 5½ by 8½ in., $3.95.

Television Antenna Handbook is a complete guidebook for TV service shops. Fourteen chapters, combined with 265 illustrations, thoroughly cover the subject of antenna maintenance and installation. Antenna information is classified by reception areas — primary, secondary, fringe, and far-fringe.

The chapters cover: the television signal, antenna characteristics, commercial TV antenna types, transmission lines, antenna rotators, installation planning, on-location tests, tools and equipment, towers, masts and guying, roof-top techniques, installing antennas and lead-in, noise, UHF, and color, unusual installations, and servicing the antenna system.

These books are sold through electronic parts distributors throughout the country, or available from Howard W. Sams & Co., Inc.

(For further details encircle index code 0725)

10TH ANNIVERSARY CATALOG

Bergen Arts & Crafts has available a new 10th Anniversary Catalog on their complete line of enameling, jewelry, mosaic, and ceramic supplies. Fully illustrated catalog is free if requested on school letterhead.

(For further details encircle index code 0726)

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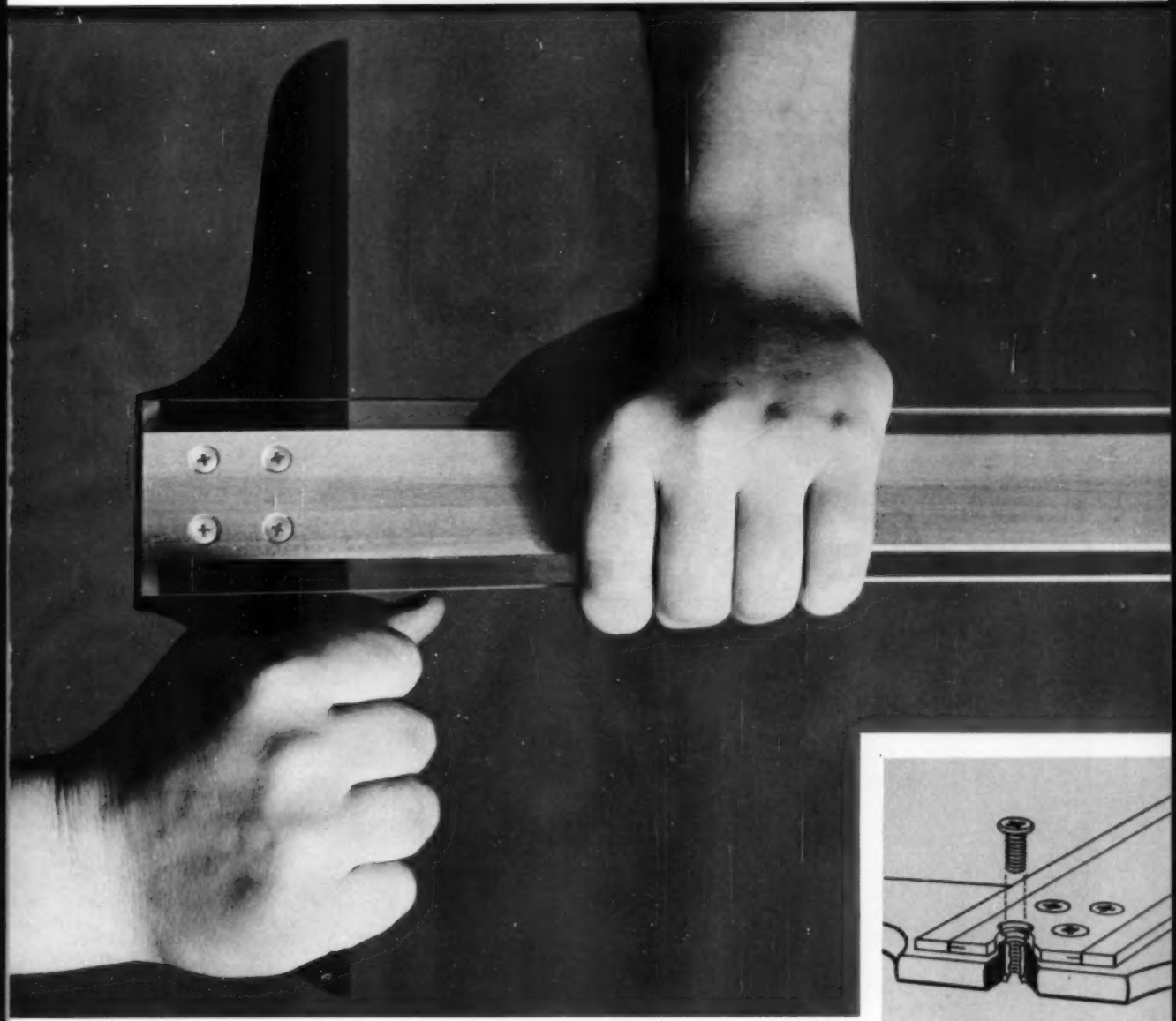

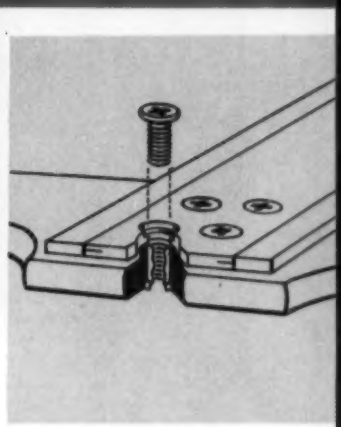

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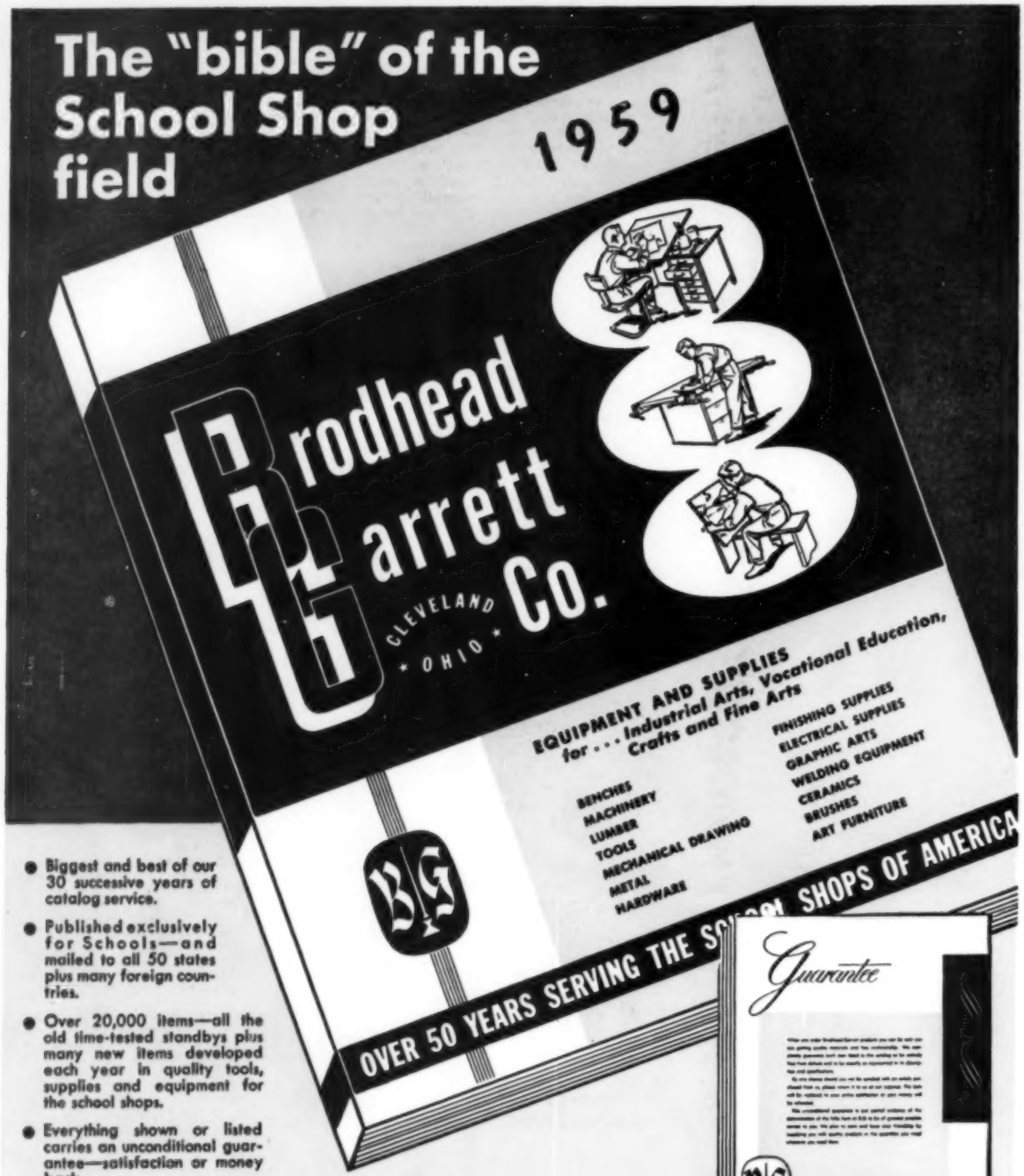

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SHOP EQUIPMENT NEWS

(Continued from page 32A)

HEAVY-DUTY DRILL PRESS

Powermatic Machine Company have just introduced their Model 1100-15-in. Heavy-Duty Drill Press, which is only one of their new entries into the metal and woodworking field announced recently. Other new units are the Model 1200-20-in. Drill Press, Model 86-20-in. Metal Cutting Band Saw, and the Model 65-10-in. Tilting Arbor Saw.

Model 1100 Heavy Duty Drill Press

This new Drill Press features the Powermatic Quik-Set variable speed selector affording instant speed settings without belt changing. Maximum drilling diameters of the new machine are ½ in. for cast iron and ⅜ in. for steel. Standard (vertical adjustment only), tilting, and production tables are available as well as floor and bench models.

The Quik-Set Spindle speed selector allows instant, infinite speed settings of from 600 to 4800 r.p.m., on the High Speed Model and from 450 to 2800 r.p.m., on the Slow Speed Model. Just dial the speed setting anywhere in the range. There are no tools to use, no belts to change. Change speeds while the drill press is running.

Model 1100 is also available in step-pulley models. The High Speed Model can be set for 680, 1250, 4600 r.p.m., while the Slow Speed Model can be set at 470, 780, 1300, and 1950 r.p.m.

It has a quill diameter of 2 5/16 in., with a key chuck range of 0 to ½ in. The stroke is 4¾ in., with table work surfaces of 10 by 11 in. (tilting) and 12 by 18 in. (production). Base working surface is 8½ by 12 in.

For complete specifications and details write for Bulletin No. 70.

(For further details encircle index code 0711)

WATER SKIS AND COMPLETE ACCESSORIES

Lauderback Industries, a manufacturer of quality water skis and equipment for many years, has announced a program to serve industrial-arts departments directly, throughout the United States.

Water ski bindings, fins, and unfinished ski blanks are available. It is of interest to know that this company has most durable water ski bindings, as illustrated by the fact that more than 50,000 pair have been merchandised without a single return.

A complete price list is available.

(For further details encircle index code 0712)

NEW PLASTIC-COATED SPIRIT MASTERS

A. B. Dick Company announces a new, clear plastic coating to replace the former metallic coating on all A. B. Dick spirit masters. The new plastic-coated masters maintain the cleanliness feature of the older metallic-coated sets, while offering important additional advantages.

Copies are consistently more intense in color, with no sacrifice in length of runs. Greater sharpness in copy from the new master provides improved readability, especially where the smaller elite size type faces are used.

The new master units also make possible easier and faster makeready, resulting in more efficient imprinting of business systems forms, letterheads, titles, and similar spirit duplicating work.

(For further details encircle index code 0713)

NEW WALKER-TURNER BELT GRINDERS

Rockwell Manufacturing Company's Walker-Turner Division have introduced a complete line of versatile, 2½-in. belt grinders. This new line fills the need for low-cost machines to do fast, efficient grinding, buffing and deburring in commercial metalworking shops, plant maintenance shops, tool rooms, and other industrial areas. Where they are used instead of wheel grinders, the new belt grinders eliminate the bother of set-up wheels and wheel dressing.

In addition to the four standard setups — single horizontal, double horizontal, horizontal and vertical, and double vertical — a variety of accessories are available which make it possible to build low-cost special job setups. These accessories in-

(Continued on page 36A)

Both NEW and DIFFERENT SHELDON 15" PRECISION LATHES

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SHOP EQUIPMENT NEWS

(Continued from page 33A)

New Walker-Turner Belt Grinder

clude: vertical support unit, safety guards, dust and chip chute, fully adjustable platen, dust collector, and an adjustable toolrest for grinding.

A 4-in. backstand idler unit is also available. With this unit a polishing lathe using setup wheels or a bench grinder using grinding wheels can be converted to a modern coated abrasive belt method of grinding and polishing.

The new Walker-Turner Belt Grinders feature lubricated-for-life, double-sealed, preloaded ball bearings; precision bored seats, precision ground shafts, and dynamically balanced arbor pulleys.

Standard equipment includes the arbor head, rubber contact wheel, 2¾-in. backstand idler unit, and an abrasive belt. Belt speed is 5400 f.p.m., with 6-in. contact roll using standard 1725 motor.

Further information available.

(For further details encircle index code 0714)

DELTA 12-INCH WOOD LATHE

A new gap-bed 12-inch wood lathe that combines the versatility of variable-speed with low cost has been introduced by Rockwell Manufacturing Company's Delta Power Tool Division.

New Variable-Speed Delta 12-in. Wood Lathe for Schools

Particularly applicable for school shops, the new lathe is designed for highly accurate wood turning, metal spinning, sanding, grinding, polishing, buffing, drilling, and many other operations.

The variable speed drive has an easy-to-read speed scale and a conveniently located hand wheel for quick dialing of any speed from 660 to 3550 r.p.m. The correct speed for any of the above operations can be obtained while the machine is running. The speed control can also be locked at any speed to eliminate the possibility of inexperienced students making incorrect speed adjustments.

The new wood lathe also features: a massive one-piece bed; a double-row, preloaded spindle bearing at the work end; handy storage shelves; and belts and pulleys completely guarded.

Stock is turned up to 12 in., over the bed and up to 15½ in., in the gap. Larger face plate work can be handled on the outboard spindle. Weight without motor is 270 lb.

Further information available.

(For further details encircle index code 0715)

SPRAY GUN CONDITIONER

Wisconsin Laboratories, Inc., the manufacturers of Protexem Vapor Action Brush Conditioners, have developed a very simple device for protecting spray guns to keep them from clogging. Nozzles of spray guns become clogged at the most inopportune times. A delay or interruption in the use of the spray gun causes the paint to harden at the small openings in the nozzle.

Ordinarily it is necessary to take the gun apart and to wash the parts in high powered liquid solvents which are often dangerous. Many solvents used for cleaning spray guns have dangerously low flash points and because of their rapid evaporation they present a hazard because of their toxicity.

Aside from the element of danger in cleaning the gun in this manner there is the loss of time and the wear and tear on the threaded parts of the gun.

Protexem Junior Vapor Action Conditioner

Protexem Junior is a miniature Vapor Action Conditioner which employs the superior dissolving power of vapors. This method has been in use for more than 15 years in the well known Protexem Brush Conditioners. The small Protexem slips over the nozzle of the gun, making it unnecessary to dismantle the spray gun or to disconnect the material hose. A flexible diaphragm at the open end of this conditioner forms a tight seal around the nozzle of the gun.

It takes only two tablespoons full of Vapor Solvent to charge this small conditioner. Solvent evaporates within the conditioner and the vapors of the solvents soften the hardened paint and keep it in a dissolved condition. The gun is protected during brief interruptions, overnight, or over the week end. In fact the vapor action will dissolve paint which has hardened on the nozzle of the gun so that the gun can be put into use without dismantling.

(Continued on page 38A)

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• **NO. 250** Red Cedar Superdeep Storage Chest with convenient drawer for small garments. Chest is 19¼" deep inside, has 4" by 33½" drawer, with plywood bottom. Overall size 26" high, 46¾" long, 20⅛" wide. Solid Cedar except 5 ply top. Roomy!

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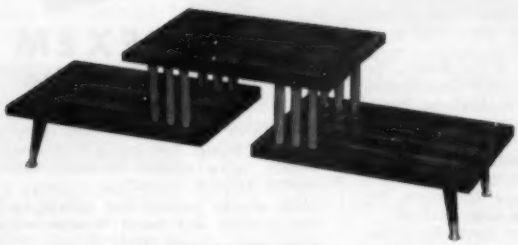

• **NO. 15** Occasional table of rare beauty. Top matched Cedar plywood. Dowels in white wood. Brass ferrules on legs. Top size 17¼" by 57½", stands 16¼" high. Smart! Unusual design!

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SHOP EQUIPMENT NEWS

(Continued from page 36A)

The Vapor Solvent used has a flash point of 70 deg. F., moderate toxicity, moderate evaporation rate and high potency as a solvent. Because of the very small amount of solvent needed to produce the vapors, fire and health hazards have been all but eliminated.

(For further details encircle index code 0716)

AMF DeWALT "1030" MODEL RADIAL-ARM MACHINE

A new commercial model radial-arm machine, especially designed for small builders, cabinetmakers, contractors, light production, and schools, has been introduced by DeWalt Division of American Machine and Foundry Company.

The new model, designated "1030" (signifying a 10-in. blade, 3-in., depth of cut) replaces a previous model GWI, and incorporates major changes resulting from DeWalt's policy of offering the professional user increased safety, power, and operating versatility.

AMF DeWalt "1030" Model Radial-Arm Machine

The principal feature of the new model is the newly designed, totally enclosed, fan cooled, direct-drive motor, the first of its kind in the radial-arm 10-in. field. The flat-bottom design of the new motor, which operates on 120-240 volts, permits a 10-in. saw to cut three inches deep while delivering three horsepower at the cutting spindle. Because of a new yoke design, the motor can be tilted a full 360 deg., adding to operating versatility.

As an integrated part of the motor, the "1030" has a built-in electro-mechanical brake which stops a 10-in. blade within 8 seconds after power shut-off, thereby assuring greater operator safety and facilitating quicker changeover in cutting setups. Without this new motor brake, a 10-in. blade would continue to rotate for approximately 90 seconds after shut-off.

Other major changes have been included. Additional information can be obtained.

(For further details encircle index code 0717)

NEW MODEL 200 FOLEY AUTOMATIC SAW FILER

Foley Manufacturing Company have introduced the new model 200 Foley Automatic Saw Filer which will file the so-called "combination" (rip and crosscut) circular saws; also crosscut circular saws,

(Continued on page 40A)

NEW Hotpack HIGH TEMP. KILN

Temperature to 2350° F.

HEAVY DUTY

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Fast come-up time 5 hrs. to 2300° F. 7" of insulation, including interlocked 2500° F. brick. Controls grouped in eye-level panel, recessed with special plexiglass cover to prevent unauthorized adjustment while in operation. Many other features.

SPECIFICATIONS

Model	Interior Size	Watts	Price F.O.B. Phila.
7021	10"x 9½"x 9"	2.8KW	$ 225.00
7024	19"x18½"x18"	230 volts	$1080.00

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Save Brushes
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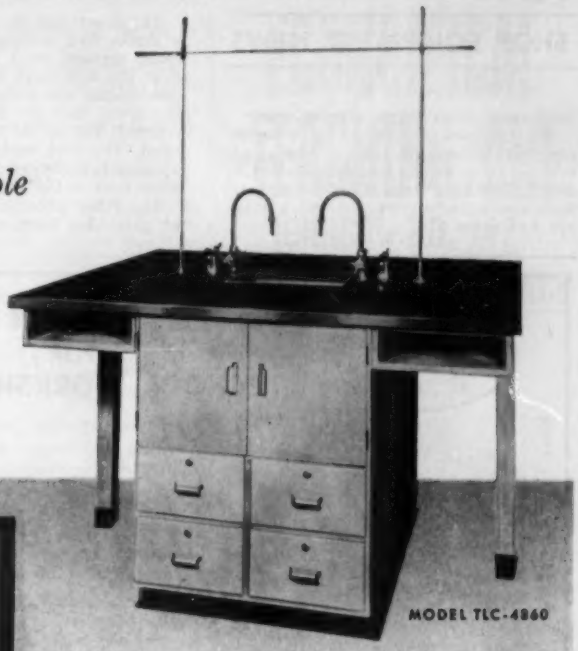

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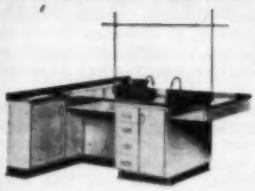

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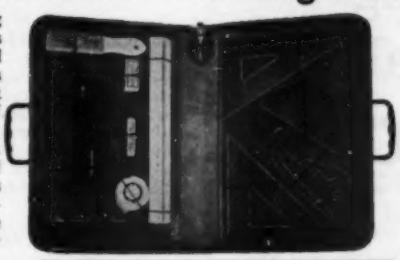

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C7702 has metal edge split Basswood top and Oak base with supply drawer. Send for prices on both tables.

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(For more information from advertisers, use the postcard on page 53A)

SHOP EQUIPMENT NEWS

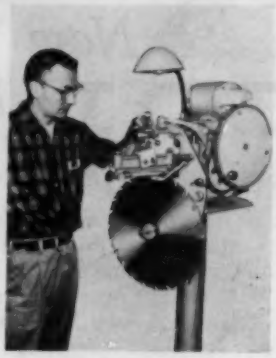
(Continued from page 38A)

band saws, and all types of hand saws.

The combination saw which is widely used for table saws and portable power saws, has a series of segments separated by deep gullets. Each segment has two or more teeth which can be sharpened with a standard 3-cornered file.

The new model 200 Foley Saw Filer has a simple feed mechanism which feeds an entire segment on a combination circular saw. The first tooth in each segment of a combination saw is sharpened, clear around the saws; then the second tooth in each segment, and so on, until the saw is finished. The feed mechanism is also easily adjusted to feed from tooth to tooth for all other saws, as fine as 16 points per inch.

The Foley principle of jointing the saw as it is filed, keeps all teeth uniform in size, shape, and spacing. This feature keeps circular saws perfectly round, so they run cooler, last longer and are less apt to crack.



Foley Saw Filer

The new model 200 Foley Automatic Saw Filer, in addition to combination circular saws, files all hand, back, and miter box saws; band saws up to 4½ in. wide and up to 24 ft. long; crosscut circular saws up to 24 in. in diameter. Tooth size for all saws ranges from 3 to 16 points per inch; the machine uses standard 3-cornered files.

The ability of the machine to sharpen combination circular saws greatly increases its utility, not only for woodworking and industrial plants, contractors, builders, manual training departments and vocational trade schools, but for custom saw filing and repair shops as well. The precision and accuracy of automatic machine filing increases the cutting production of power saws from 25 to 40 per cent.

Further information may be obtained on other features of this model.

(For further details encircle index code 0718)

YATES-AMERICAN SCROLL SAW

Yates-American Machine Company announces a new addition to its long line of power tools — the J-226, 26-in. Scroll Saw. The saw offers two outstanding features — over-size capacity and smooth action. The saw has 2-in. depth capacity and a full 26-in. throat. The machine has no die cast moving parts and will give years of trouble-free performance. It can be used for saber work or bench filing by removing the overhead arm.

Additional information available by writing to Power Tool Division, Yates-American Machine Company.

(For further details encircle index code 0719)

O'NEIL-IRWIN "PACKAGE DEALS"

O'Neil-Irwin Mfg. Company have been offering "package deals" on the purchase of several Di-Acro Precision Machines rather than spreading individual purchases over a number of years. It gives the school shop an opportunity to set up a metalworking area with first-class equipment at a money-saving price. There is a saving of approximately 10 per cent on the purchase of one or more of their four package deals. They are available to school shops *only*.

Spartan model Brake, Roller and Shear have the same features as their industrial counterparts. Basic difference between them is that the industrial models, in most cases, have more elaborate gauging systems.

Individual machinery stands are of welded, steel construction. Machinery tables are of heavy-gauge steel, braced for added strength, and predrilled for mount-

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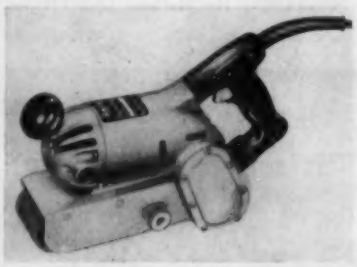
ing machines. All machines are backed by a one-year warranty.

Write for full details on alternate package deals with the new 36-in. Hand Operated Di-Acro Shear.

(For further details encircle index code 0720)

NEW SKIL BELT SANDER

Skil Corporation have made available their new Skil 2¼-in. Belt Sander. It combines super duty power and light weight — just 10½ lb. The 2¼-in. Model 505 Belt Sander is excellent for paint removal and for surfacing wood, plastic and compositions.



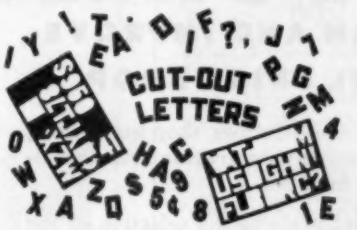
New Skil Belt Sander

The sander may also be used to level light weld beads on ferrous and non-ferrous metals. The contour grip rear handle with built-in trigger switch and extra large front handle make the tool easy to handle in any position. Belt changes take 5 seconds. This is an all-purpose sander for carpenters, cabinetmakers, and repairmen.

(For further details encircle index code 0721)

CUT-OUT LETTERS FOR EFFECTIVE DISPLAYS

Mutual Aids have introduced their new cutout letter sets, which serve as effective aids to preparing bulletin board displays for educational purposes. These cut-out letters are made from durable colored cardboards. The letters may be used for many purposes, such as signs and displays and posters. Schools use them for stimulating the child's interest in spelling, phonetics, and arithmetic.



New Cut-Out Letters for Effective Displays

These cut-out letters come in a variety of colors (red, black, green, yellow, blue, and white), and are available in 2-in. capital letters in sets of 180 letters, numbers and signs; also in 1½-in. manuscript style in sets of 240 letters; and 4-in. capital letters in sets of 150 letters, numbers and signs. One color, one size per set. Easy mounting is done by using a reusable 2-sided plastic adhesive.

Free samples and further information can be obtained by writing to Mutual Aids.

(For further details encircle index code 0722)

ECONOMICAL TEACHING AID

JOHNSON NO. 142 HEAT TREATING FURNACE

HEATS FAST, SAVES TIME

Start heat treating high speed and carbon steels while other furnaces warm up. Powerful burners in this efficient furnace get heat up to 1300°-2350° F. range in minutes. Gets the job done fast to save time and gas. Temperatures accurately and quickly regulated. Ratchet arrangement permits holding door in various positions.

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Business and Personal News

PRESIDENT OF CHANDLER & PRICE DIES

David Waddell Frackelton, president of the Chandler & Price Company, Cleveland, for the past 19 years, died June 24, 1959. He joined the firm in 1913 as vice-president and treasurer, and became the president in 1940.

AMF DeWALT APPOINTS DISTRICT SALES MANAGER

Ronald L. Harrer has been appointed as a district sales manager with responsibility for sales coordination within the area covering the state of Arizona, southern Nevada, and southern California, it was announced recently by Conde Hamlin, the firm's president.

In his new capacity, Mr. Harrer will represent the complete tool line of AMF DeWalt. His permanent headquarters will be at San Diego, Calif.

HERMAN DYKEMA PROMOTED

Herman Dykema, formerly assistant sales manager of the Machine Tool Division of Kalamazoo Tank and Silo Company, has been promoted to district sales manager for seven Southeastern States to include Alabama, Florida, Georgia, Tennessee, North Carolina, South Carolina, and Virginia. Mr. Dykema will reside in Atlanta.

Mr. Dykema will represent Kalamazoo's complete line of horizontal metal cutting band saws and accessories.

MILWAUKEE TOOL AND EQUIPMENT COMPANY APPOINTMENTS

The firm of Surpless, Dunn & Appleyard, Inc., 57 Leonard Street, New York City, has been appointed sales representative for the Milwaukee line of vises, as announced by John Thayer, vice-president in charge of sales at Milwaukee.

Surpless, Dunn & Appleyard will handle the Milwaukee line on an exclusive basis, to both hardware and industrial accounts in the Metropolitan area of New York City.

The firm of W. R. Rosenstiel and R. R. Norton, Chicago, Ill., has been appointed to the position of midwest sales consultant with Milwaukee Tool and Equipment Company.

This firm will function in a sales advisory capacity on servicing hardware and industrial accounts within the midwest territory.

Milwaukee Tool and Equipment Company builds malleable iron machinist vises, workbench vises, woodworking vises, pipe tools, and screw jacks.

BRUNING COMPANY PERSONNEL

Dr. Carl Botkin was elected vice-president in charge of Research by the Board of Directors, Charles Bruning Company, Inc.

He will head the research program in the diazotype and electrostatic copying Division.

Dean Snyder has been promoted to national sales coordinator for the company, and his duties will include promotional planning for new products and conducting market surveys on existing products. He will act as liaison between the marketing and promotion department at Mt. Prospect, Ill., and the regional promotion managers.

BOBBS-MERRILL NEW TESTING DIVISION

Acquisition of the testing products and complete services of The Public School Publishing Company and the C. A. Gregory Company of Cincinnati, Ohio, by the Bobbs-Merrill Company, Inc., was announced recently by M. Hughes Miller, President of Bobbs-Merrill. This is a significant step in the expansion program of the 121-year-old Indianapolis and New York publishing firm, an associate of Howard W. Sams & Co., Inc., and gives the firm a completely rounded service in the educational field.

James Finger, former president of the Gregory and Public School Publishing firms, joins the Bobbs-Merrill staff as educational director of the new Testing Division, and Mrs. Helen Gregory Finger becomes editorial supervisor of the division.

SPS GRADUATES SEVENTEEN

Seventeen distributors and inside salesmen were graduated in May, 1959, from a three-day Columbia training course conducted by Columbia-Hallowell Division, Standard Pressed Steel Company, Jenkintown, Pa., in the design, manufacture, and use of office furniture and Erectomatic shelving.

(Continued on page 44A)

NEW BOOKLET

HELPS YOU PLAN AND IMPROVE YOUR SCHOOL PRINT SHOP

Here is a helpful aid to school supervisors, shop instructors, and others interested in planning new graphic arts departments or expanding present facilities.

This booklet provides a useful guide to the selection of the most practical paper cutting, proofing, paper drilling or punching, composition and lock-up equipment, and supplies for school print shop needs. Mail coupon for your free copy of this booklet.

SCH-101

Challenge

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Please send me a copy of the new Challenge Booklet entitled "Planning Your School Shop."

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Fit Square, precision broached openings end sloppy fits and rounded nuts. Strong but thin heads permit plenty of clearance in tight quarters.
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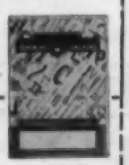
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BUSINESS & PERSONAL NEWS

(Continued from page 42A)

EICO ENLARGES FACTORY FACILITIES

A continuous area of 20,000 square feet has recently been acquired by Electronic Instrument Company, Inc., Long Island City, N. Y., bringing the Company's total factory area to 60,000 square feet.

This additional space is being used to expand the engineering and sales departments, in response to increasing consumer demand for the EICO line of hi-fi, test instruments, "ham" gear, and transistor radios in both kit and factory-assembled form.

CHARLES BRUNING CO., CHICAGO BRANCH

Relocation of the Chicago branch of Charles Bruning Company, Inc., in the Congress-Franklin-Wacker Building in the heart of Chicago's central business district, has been announced by Frank DiCanio, branch manager. The new branch was opened on April 1, 1959.

The company manufactures Copyflex diazotype reproduction machines and sensitized materials, as well as electrostatic microfilm enlarger-printers. In addition, Bruning distributes over 4000 items for architects and engineers.

BORDEN'S CASCOPHEN USED TO RESTORE SHIP

One of the world's most modern adhesives has been selected for use in restoring the world's oldest ship still afloat.

The ship is the *U. S. Frigate* "Constellation." The adhesive is Borden's Cascophen, a waterproof resorcinol glue.

One hundred gallons of Cascophen have been donated by the Borden Chemical Company to the Constellation Restoration Program. The contribution was accepted by Captain Donald Stewart, superintendent of the restoration, for Fleet Admiral Chester W. Nimitz, national chairman of the restoration program.

The "Constellation," authorized by President George Washington, has been returned to Baltimore, Md., where she was built and launched on September 7, 1797.

Contributors of $1 will receive a coin made from copper spikes taken from the ship's hull during the replanking operation. This coin is also a pass to the ship forever; the holder of a coin will not have to pay the usual admission charges to board the ship after she is restored as a National Historic Shrine.

All donations should be mailed to: *Constellation, Box 6325, Baltimore 30, Md.*

FORD INDUSTRIAL ARTS AWARD

A special medal for New York City high school students who have distinguished themselves in industrial-arts work has been established for presentation. Top seniors in each of the city's 55 academic high schools received the bronze medal late in June. It is known as the Ford Industrial Arts Award, and is jointly sponsored by the Ford Motor Company and the Association of Industrial Arts Chairmen.

Milton D. Caffin, president of the New York City Association, said the new medal will be presented annually in every city high school to a graduating student who is selected for outstanding achievement in industrial-arts work during his four years of class work.

Dr. John J. Theobald, city superintendent of schools, received the first medal.

The March School Shop Annual is packed with shop layouts, course outline, tool and material lists, equipment directory, curriculum studies and much more.

This issue sells for $1.00 singly.

Subscribe today and receive the Shop Annual as a regular issue. Subscription rates: $4.00 (1 year); $6.50 (2 years).

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Modern Wood Finishing
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1548 West Bruce St. Milwaukee 46, Wis.

(For more information from advertisers, use the postcard on page 53A)

New! BENNETT BOOKS...

1. I. A. BENCH WOODWORK
by John L. Feirer
FOR 7th AND 8th GRADES . . .

The only *new* woodworking text for the *seventh* and *eighth* grades! Students are quickly, easily introduced to planning a project; understanding tool processes and mechanics; and making objects that challenge and please.

A tested vocabulary co-ordinated with excellent illustrations makes the book serve the boys' world, *and* the instructor's program. 208 pp. Instructor's key included. $3.24

2. BENCH WOOD STUDENT GUIDE
by Feirer

An excellent supplement keyed to I. A. Bench Woodwork. 76¢

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3. SAFE LIVING
by Harold T. Glenn

A new, excellent text on safety and how to live safely. *Safety in the school shop* using power tools and equipment, driver safety, safety at home and on vacations, are just a few of the chapter headings.

Brief discussions of disasters, emergencies and first aid round out the students' introduction to this all important subject.

Order your copy today! Pre-Pub price. $3.48

4. SAFE LIVING STUDY GUIDE

A guide for the instructor in planning, and for the student in performing, a safety study program with Safe Living. A valuable teaching aid! Pre-Pub price. $1.00

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A SMALLER DRAFTING MACHINE WITH BIG DRAFTER FEATURES

Automatic indexing with convenient operation.
Full circle base line setting.

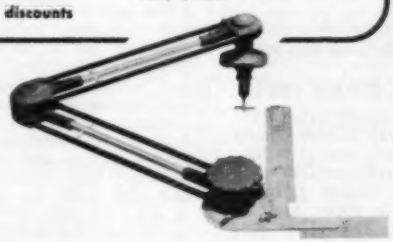
Scale arm will accept standard scales. Full size handle. Steel band covers. Has the VEMCO coin-slotted brake. Suitable for boards up to 24" x 36".

$66.00 LIST PRICE

Write for special school discounts

Scales available for this machine in 9" and 12" lengths. 9" size, $3.90. 12" size, $4.60.

NOTE: Also available as Model 3400, without indexing. $57.50 List Price.



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COMBINATION DESK AND DRAFTING TABLE

MULTI PURPOSE

- Made of Europe's Finest Beechwood with custom alterations available.
- Desk is 30" high and measures 37" x 28." Can be used flat or tilted to 70°.
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- At a price permitting extra budget dollars to be used elsewhere.

FOR DRAFTING MACHINE AND DRAWING INSTRUMENT INFORMATION WRITE:

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Shop Equipment News

KNIGHT-KIT "RANGER III-PC" AC-DC RADIO KIT

Allied Radio Corporation announces the release of the new Knight-Kit "Ranger

Knight-Kit "Ranger III-PC" AC-DC Radio Kit

III-PC" A.C.-D.C. Radio Kit. Designed around a modern superheterodyne circuit employing four tubes plus rectifier, this easy-to-build receiver tunes the entire standard AM broadcast band. A new feature incorporated in this model of the Knight-Kit "Ranger" series is the use of a printed circuit board which greatly reduces asembly time and the possibility of wiring errors. The kit is supplied complete with all parts including the cabinet which is smartly styled in lustrous ivory and contrasting brown. Only a soldering iron, screw driver, and a pair of pliers are required for assembly.

The "Ranger III-PC" circuit incorporates automatic volume control to prevent blasting and fading. A highly efficient, built-in loop antenna eliminates the need for an external antenna. The speaker is of the permanent magnet type with an Alnico V magnet.

Designed for operation from 110–125 volts, 50–60 cycle a.c. or d.c., the "Ranger III-PC" is listed under Allied's Stock No. 83 V 738.

(For further details encircle index code 0701)

THE NEW BOWLATHE

The Bowlathe Company have introduced their new power tool, The Bowlathe. It is intended for use in schools, camps, and home workshops.

The Bowlathe Model 1658 is 11½ in. high, 16 in. long, and 11 in. wide, and has a wood capacity of 16 in. in diameter.

Other specifications include: Motor — ⅓ or ½ h.p., 1725 r.p.m.; drive — single V belt, 3 step cone pulleys; Bowlathe shaft speeds in r.p.m. — 800, 1400, 2900; bearings — sealed ball bearings, long life, requiring no lubrication at any time; weight — 38 lb.

It comes completely assembled with 4-in. faceplate. The motor pulley is also furnished.

Accessories available are ⅓ and ½ h.p. motors, turning tools, belt, belt guard, motor rail, and 4 and 8-in. faceplates.

The Bowlathe turns bowls, dishes, trays, plaques, table tops, clock cases, lazy susans, and other articles up to 16 in. in diameter. It turns, sands, and finishes the complete job with only one mounting on the faceplate.

For further information write to The Bowlathe Company.

(For further details encircle index code 0702)

ALVIN TECHAGRAPH FOUNTAIN PEN

Alvin & Company, Inc., now offers the revolutionary new Techagraph Technical Fountain Pen. The Techagraph is designed for high speed precision pen work. It may be filled directly from the ink bottle and provides a large, continuous supply of ink. It will prove invaluable to technicians, professionals, and students as a time saver.

Alvin Techagraph Fountain Pen

Ideally suited for offset printing, Thermofax machines, reproduction, duplicating, etc., the Techagraph guarantees sharp, uniform lines. It will not leak nor clog. Separate nibs are available in six line widths ranging from superfine line width to extra-broad line width. The refill cap is permanently attached and plunger stops automatically. The clear-view window makes ink supply easily visible. Almost all types of ink can be used; not acetate inks. The Techagraph is easy to clean just by rinsing in water and wiping dry.

Its modern design is enhanced by smart jet black styling, chrome trim, and spring pocket clip. Each Techagraph is individually packed in a plastic case with sponge lining that prevents drying and makes nibs always ready for instant use. Humidor container keeps nibs fresh for weeks.

Additional information available.

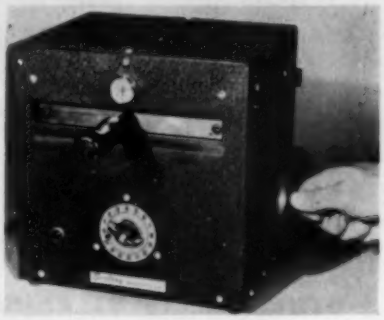
(For further details encircle index code 0703)

BERKROY RUBBER STAMP PRESS

Berkroy Products Company have introduced their new Berkroy Rubber Stamp Press. It is a revolutionary concept in rubber stamp producing equipment. Easy to operate, the Berkroy Stamp Press is equipped with a built-in timer, heat indicator, and thermostatic control for simple two-step operation.

It is compact, measuring 8 by 9 by 10 in., and weighs 75 lb. It operates on 110-v a.c. current.

The case is all steel with heavy-duty steel frame construction and solid aluminum platens. The finish is attractive, long



Berkroy Rubber Stamp Press

life, heat resistant, black crackle paint.

For complete information and catalog write to Berkroy Products Company.

(For further details encircle index code 0704)

NEW BLACK & DECKER POWER PLANE

A new Power Plane is now being produced by the Black & Decker Mfg. Company that operates by direct drive, without gears, at speeds up to 21,000 r.p.m., to produce an extremely smooth, level finish. Designed for fast, precise edgework, the new Black & Decker Power Plane (Catalog No. 19) facilitates production-type planing jobs with guaranteed accuracy and assured professional results.

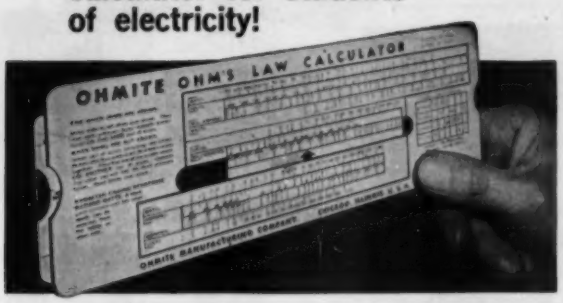
New Black & Decker Power Plane

The unit is designed for most comfortable operating balance. Handles and thumbrest are so placed as to provide an accurate planing "feel" and afford the correct "inward and downward" pressure for each planing operation. It is engineered for continuous production service, with built-in features that include special Black & Decker Motor and lubricant-sealed ball bearings; fully adjustable cutting depth and edge guide for mitre-planing up to 45 deg., inwardly (toward shoe), and up to 30 deg., outwardly; and an exclusive "flat top" designed motor housing that permits standing the complete tool on end for quick, convenient depth or angle adjustment.

Cutting depth of the No. 19 Power Plane

(Continued on page 49A)

A time-saving calculator for students of electricity!



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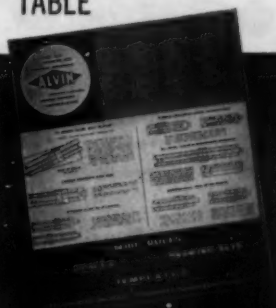

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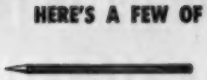

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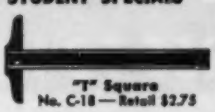

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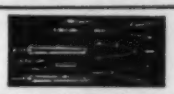

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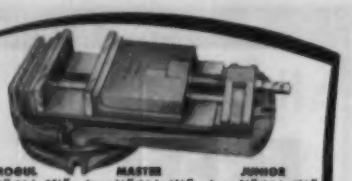

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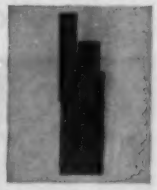

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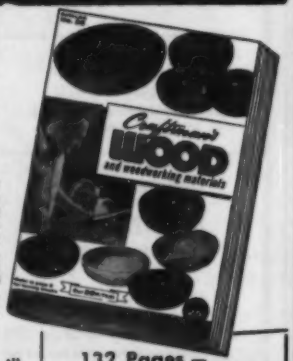

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SHOP EQUIPMENT NEWS

(Continued from page 46A)

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(For further details encircle index code 0705)

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(For further details encircle index code 0706)

(Continued on next page)

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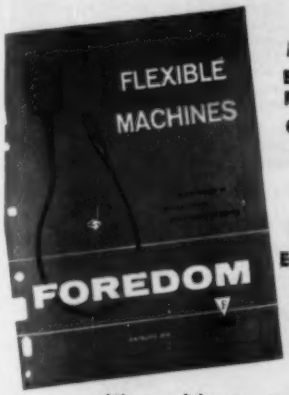

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SHOP EQUIPMENT NEWS

(Continued from previous page)

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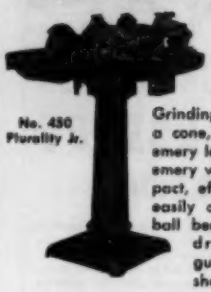

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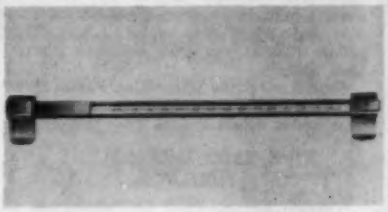

Steel Tape Thermometer

Used to calculate expansion and contraction of steel measuring tapes in extreme temperature conditions, the new thermometer has a mercury reservoir bulb that is held in direct contact with the tape, thereby measuring actual tape temperature rather than air temperature.

The thermometer's below zero markings are in red, above zero markings are in black. This makes the indicator easier to read and reduces the chance of recording a plus sign in error.

According to the K&E announcement, a tape thermometer is a necessity for the surveyor who must make complete, accurate measurements. On a winter day when the air temperature drops from 50 deg. (F) at noon to 20 deg. at 4:00 p.m., a 100-foot steel tape may contract as much as 0.6 inches. Similar change would take place after exposure to direct rays of the sun when the tape temperature may be raised to 20 to 30 deg. above air temperature.

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(For further details encircle index code 0708)

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(Continued on next page)

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SHOP EQUIPMENT NEWS

(Continued from previous page)

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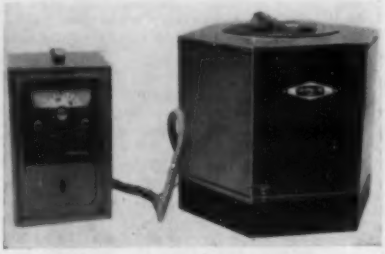

Type 2100 Thermolyne Furnace

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The basic unit includes the hexagonal furnace (115 or 230 volts, chamber 6⅝ in., dia. by 11½ in., deep), stainless steel pot (6⅜ in. dia. by 7½ in. deep) with cover and convenient lifting handle, and thermocouple in protection tube. Optional maximum-use accessories include a refractory ladle, refractory chamber liner, and insulated cover.

The furnace case is of heavy-gauge welded and braced steel construction and is finished in corrosion and heat-resistant enamel. Three separate and distinct types of insulation are so utilized as to minimize heat loss and maintain even temperatures. Heavy gauge nickel chromium heating coils held in refractory supports line the chamber uniformly.

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(For further details encircle index code 0710)

(Continued on page 33A)

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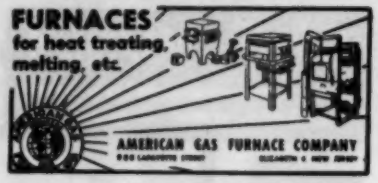

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